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**HOLLYWOOD**

by the  
American Society of Cinematographers

# *The American* **CINEMATOGRAPHER**



**March 1933**


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## FILMO

THE AMERICAN SOCIETY OF CINEMATOGRAPHERS was founded in 1918 for the purpose of bringing into closer confederation and cooperation all those leaders in the cinematographic art and science whose aim is and ever will be to strive for pre-eminence in artistic perfection and technical mastery of this art and science. Its purpose is to further the artistic and scientific advancement of the cinema and its allied crafts through unceasing research and experimentation as well as through bringing the artists and the scientists of cinematography into more intimate fellowship. To this end, its membership is composed of the outstanding cinematographers of the world, with Associate and Honorary memberships bestowed upon those who, though not active cinematographers, are engaged none the less in kindred pursuits, and who have, by their achievements, contributed outstandingly to the progress of cinematography as an Art or as a Science. To further these lofty aims, and to fittingly chronicle the progress of cinematography, the Society's publication, *The American Cinematographer*, is dedicated

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# A. S. C. Testing Committee Approves Filmo 70-D 16 mm. Camera



## Feb. 20, 1933 Report of Testing Committee On Bell & Howell Company's Filmo 70-D 16 MM. Camera

THE first piece of apparatus submitted to the Testing Committee of the American Society of Cinematographers is the model 70-D "Filmo" camera for 16 mm cinematography, manufactured by the Bell & Howell Company, of Chicago, Illinois. A stock camera of this model was submitted for the tests, which were conducted in accordance with the claims advanced for the product by the manufacturer, as well as by means of practical photographic tests made by the members of the committee.

Various types of equipment are being worked on by the committee on testing. As this work proceeds and the tests are completed the results will be published in the AMERICAN CINEMATOGRAPHER.

In view of the fact that claims on some of the articles run to such great lengths and the report of the committee in its detailed findings also require a number of pages of type-written matter, it was the decision of the committee to make available to all those who desired, copies of the claims and copy of the findings of the committee, instead of publishing all of these details in the AMERICAN CINEMATOGRAPHER.

In the last paragraph of its report, the committee made the following authorization which is quoted in part: "and does authorize the publication of this report. The Committee also authorizes the Editor of the AMERICAN CINEMATOGRAPHER magazine to supply complete copies of the claims under which this product was tested together with the findings of the committee upon which this report was based, to any who desire the same."

The benefit of these tests to the entire industry is obvious, especially to those not initiated in the mechanics and requirements of the cinematographic profession. It places on these pieces of equipment the endorsement of the greatest authority of things cinematographic in the world.

As the work progresses into various pieces of equipment in the different avenues of picture pursuit, there will be an accrued benefit that will have untold value. It will permit the purchase of a piece of equipment with complete confidence. Although some apparatus may not have all of the refinements that is possessed by another, still within its price field, it is fully representative of a good piece of merchandise worthy of the purchaser's attention and use.

With the rapid development in the cinematographic field, especially in the substandard activities, these tests will represent a definite value.

WHEREAS the Bell & Howell Company has submitted to the American Society of Cinematographers its 16 mm camera for amateur cinematography, known as the "Model 70-D Filmo," duly accompanied by the aforesaid manufacturer's claims and specifications for that article, and

WHEREAS the Testing Committee of the American Society of Cinematographers has duly tested the said product in accordance with these specifications, and with practical photographic tests, and

WHEREAS the said Testing Committee has found the said "Filmo 70-D" camera to be satisfactory according to the aforementioned claims and to have satisfactorily undergone the Committee's photographic tests.

THEREFORE does the Testing Committee of the American Society of Cinematographers certify that the said "Filmo camera, model 70-D" is worthy of the Approval of the American Society of Cinematographers, and does authorize the Secretary of the said society to bestow upon the said "model 70-D Filmo camera" the mark of the Society's approval, which Stamp of Approval the Committee does authorize the said Bell & Howell Company to imprint upon their product, the said "model 70-D Filmo camera," and to use in their advertising of that product so long as the design and manufacture of the said product does remain unchanged.



New Sound Concentrator as designed by Warner Brothers Vitaphone engineers, marking a very definite advance in sound recording. This concentrator is not only capable of picking up sounds at a great distance, it is also capable of rejecting a large degree of extraneous sounds originating behind or to the sides of the parabola. In the photo above are Director Mervyn LeRoy at right and Major Nathan Lindgren, Director of Recording at Warner Brothers at left.

As indicated at the sound demonstration before the meeting of the Technicians Branch of the Academy of Motion Picture Arts and Sciences, held at Warner-First National studios February 16, we are all accustomed to eliminating extraneous, unnecessary and undesirable sounds as we go about our daily existence. We do this naturally and normally and without ever giving it a thought.

The microphone, however, does not have a brain and is therefore not capable of distinguishing between desirable and undesirable sounds. We have to do that for it.

The sound mixer has a great responsibility in this respect during the filming of a picture, and the re-recording mixer has an even greater responsibility in preparing the final sound track. They are charged with the proper recording and mixing of all desirable sounds for the picture, but they are also charged—and this is very important—with the elimination of all undesirable, even though natural, sounds from the film. A picture overladen from the sound standpoint would mar the excellence of all the other work contributed to it, and could in no manner be considered good entertainment.

The sound mixers must always keep in mind that the ultimate object of their work is to provide pleasing entertainment for the audience when the picture is projected before it.

In our demonstration, with a concentrator on the roof of the sound building in which it was given, we indicated to the audience the many sounds going on about us all the time, of which we are at least partially unaware, which when picked up by the microphone and amplified are extremely annoying. They suddenly take a relation to us altogether out of proportion to their value. In this way we demonstrate that the sounds of automobiles passing at several blocks distance, the sounds of people speaking and shuffling their feet on the streets, as well as many other

## Re-Recording,

unimportant sounds, are always present, but are eliminated by our brain and nervous system, which picks and chooses among the sounds surrounding us to select the ones important to the moment.

The sound mixer is the brain of the microphone, which is in turn the ear of the picture.

In the same manner, by the simple device of running a strip of film first without sound of any sort, then with dialogue, then with dialogue and sound effects together, we are able to indicate to a somewhat astonished group of film laymen that the addition of sound to a picture is as definitely an art function as is photography or acting or directing, heightening or lowering the dramatic effect of the sequence at the will of the sound re-recording mixer.

Some of the reasons for re-recording sound may be briefly enumerated. They are (1) to add music, (2) to add sound effects, (3) correcting variations in sound quality and sound intensity, (4) correcting sound perspective to fit picture action, (5) to make additional negatives, (6) to transfer sound from film to disc records and vice-versa, and (7) to provide sound for sequences which may have been photographed without sound.

The primary function of re-recording, dubbing or duplicating is to make a smooth, finished negative so that finished prints for release may be run off at will. In the production of talking motion pictures, sequences are necessarily photographed in many short scenes and from many angles. These sequences, when assembled by the film editor, necessarily, in many instances, overlapping of dialogue, additional dialogue, and the dubbing in of music and sound effects to provide realism, making sound equal in importance with good acting, good photography, good story and good directional technique in the success of the picture.

When sound was first introduced into the motion picture by Warner Brothers, it was regarded very much as an ornament on the Christmas tree—that is, it was a novelty with which to dress up the picture and make it more pleasing as entertainment or visual education. The first sound motion pictures produced by Warner Brothers in the Manhattan Opera House, New York, in the year 1926, were short subjects varying from six to twelve minutes running time in length, or were "one-reel shorts." We were faced with the necessity of making these "one-reel shorts" because we had no knowledge of, or facilities for, re-recording or dubbing sound. As we were producing all these early shorts by recording on discs, the re-recording problem seemed insurmountable.

Early in 1927, when the production of talking pictures was transferred to the Hollywood studios, our engineers devised a method for "cutting" disc records, or re-recording short sequences from a series of disc records to one full-length master record. This re-recording was done on a development laboratory basis and was, quite naturally, very crude and very expensive. But even with this crude equipment, it was possible to produce the first talking pictures of feature length, "The Jazz Singer," "Lights of New York," "Glorious Betsy" and a few others.

During the production of these pictures, the Warner Brothers engineers developed an equipment, consisting of a



# Dubbing, or Duping

by

**Nathan Levinson**Director of Recording  
Warner Brothers-Fox National Studios

series of disc turntables controlled by relays operating in pre-determined sequences, whereby a series of one or more disc records could be started and stopped automatically as desired; and with this equipment available, we proceeded to the production of large musical pictures, which are now history—"The Singing Fool," "The Show of Shows," etc.

The development of automatic equipment continued until Warner Brothers decided to adopt completely the recording of sound on film. By that time the development of automatic equipment had been developed to such a high state that it was possible to scribble a ten-syllable word to the point of unrecognizability and bring it back to its original form at will.

The problem of re-recording from film is quite simple as compared with re-recording from discs, as the film can be cut at any point desired and patched to other pieces of film, forming fairly smooth sequences. The smoothing out of these sequences where they are joined together, however, can only be efficiently negotiated by men who have developed a technic or "touch" from long experience in dubbing. In fact, as I have intimated, the re-recording mixer is very definitely a specialist.

But not only is this man a specialist in the art of dubbing, he is also a specialist in the technic of the individual sound where he is employed, as the final result, or the finished sound track, is secured in a different manner at different studios. I can, therefore, only indicate how this result is obtained at Warner Brothers and Fox National studios.

Here, after a director completes the direction of his picture, the editorial department assembles the sequences into reels, and the production executive views these reels in what we term editorial runs. After the production executive has the picture reduced or lengthened to his satisfac-

tion, with lap-dissolves, fades and cuts made to form a smooth and pleasing production, the editorial department transfers the working print, together with the sound track, to the re-recording department. Here the picture is carefully analyzed by the re-recording mixer, the sound effects editor, and the Recording Director. During this analysis, we determine the sound effects to be added, and the places at which dialogue sound tracks are to be overlapped for smoothness. After very careful checking of the working picture and sound track prints, they are forwarded to the film laboratory for the cutting and the assembly of the final negatives. A complete sound track of constant transmission printed from this negative is furnished the re-recording crew. Music which has been prepared by the Music Department, and sound effects which have been prepared by the sound effects editor, are combined with the dialogue which we receive on this constant transmission print to make a master sound track. After the print of constant transmission is received, the re-recording mixer determines which portions, if any, will require re-recording for quality, volume intensity or sound perspective.

The detail of re-recording these tracks to a composite, or master sound track, is, as stated before, a matter of individual technic, and as we believe we can only secure the best composite by the absolute control of each individual track, we are equipped with a large number of special reproducing machines, in order that we may have the fullest possible latitude in combining effects, music and dialogue. The importance of having the dialogue always clearly understandable goes without saying. Great care must be exercised at all times to have the sound effects recorded with the proper intensity and the music recorded at the proper level to make the finished sound picture as realistic as possible. In this effort to create realism, we have used as many as sixteen separate sound tracks, each one carefully controlled as to level, perspective and quality, to make a pleasing composite sound track.

In our own experience we have found it most desirable to re-record only such portions of the sound track as require the addition of sound effects or music, or correction for quality, intensity or perspective, as in all cases where sound track is "duped" we have, even though it might be quite small, a certain inescapable deterioration in quality—even as there is deterioration in picture quality when a picture is duped.

But as to the recording of sound itself, it is my feeling that, while sound has great possibilities for future development, and will, indeed must, play a more important part than heretofore in talking motion pictures, it is today capable of performing every function demanded of it.

In fact, it is safe to say that whenever a camera is capable of photographing objects or persons, the natural accompanying sounds in the vicinity of the objects or persons can be simultaneously, and satisfactorily reproduced.

Standard Film  
Recording  
Machine





Ernst Lubitsch

# Hollywood Still Leads . . says Ernst Lubitsch

by

Barney Hutchison

**D**ESPITE the tremendous strides which European film production has made in the past few years, American technicians and American technique are still far in the lead, according to Ernst Lubitsch, who has just returned from a vacation spent among the major production centres of Europe.

"While I visited the European studios principally for the pleasure of again greeting my old friends there," says he, "I could not help making some observations of the conditions existing in the European industry. First of all, of course, I was amazed at the tremendous improvement made in the physical equipment of the larger studios since the days when I worked there. Such plants as the great UFA studio at Berlin, and the Paramount studio near Paris, are in every way comparable to American studios, while even the smaller plants are very well-fitted.

"There is, however, one tremendous difference between the European and American studios. Europe does not have the advantage of Hollywood's superb technicians, and the inestimable benefits brought by their perfect mastery of the technical aspects of production. Of course, America has no monopoly of expert technicians, but the American cameramen are on the whole far, far ahead of their con-

tinental confreres. When I first came to this country, more than ten years ago, I repeatedly said that the American Cinematographers were the best in the world, and the passing of time has merely made that statement more true than ever. The American technician has little or nothing to learn from the European, while on the other hand the European technicians (particularly the cameramen) could learn a great deal from America.

"The art of the screen progresses only as fast as the technicians attain mastery of their difficult tasks; and where the technicians encounter difficulties, they in turn impose restrictions upon director, writer, cutter, and every other person connected with the making of the film. For example, in Europe the optical printer is practically unknown, and dissolves are made in the camera. Moreover, the cameramen there still have a great deal of trouble in doing this. In consequence, the directors, writers and cutters are forced to make most of their transitions by direct cuts. Let us say, for example, that we have a sequence showing two men talking about a woman; we want to show her on the screen while they talk about her. Here in Hollywood we would naturally dissolve from the first scene (of the men talking) to the scenes showing the woman. In Europe, they could not do that; they would have to make a direct cut from the closeup of the men talking to the woman they were talking about. To my mind, that is not good technique, for it is too abrupt—too confusing to the audience. The scenes showing the woman might be laid miles away, and at an entirely different time, such a transition is as unpleasantly jarring as a false note in music.

"The artistic phases of European cinematography are often very good, but they are based on a basically different concept from those of American cinematographers. Here, we almost always pay greater attention to lighting the faces of the players than is done in Europe; our cinematographers endeavor to register the mood of a scene visually without sacrificing a good commercial rendition of the faces of the actors. In Europe, on the other hand, the cinematographer concentrates on the general mood of a scene—and if a player's face has to be slighted, or to be left in the shadows, it does not matter so much. At times, this is good, but practiced as a general thing, I do not think it is as satisfactory as our American style of lighting.

"The moving-camera technique is used—and abused—by Europeans exactly as it is here. It is nothing new, it wasn't even new when Dupont and Karl Freund used it years ago in 'The Last Laugh'. It can be tremendously effective—or tremendously injurious. Like every other technical trick, either of direction, stagecraft or photography, the moving camera is good only as long as it is unobtrusive; as long as it is natural to a scene. Both in Europe and in Hollywood, the moving camera is used all too often as a refuge for directors who can think of no other way to keep their stories moving dramatically than recourse to physical movement of the camera. Used that way, it disturbs the audience, often confuses them, and imposes on the cinematographer unnecessary restrictions and difficulties.

"As I have said, optical printing is practically unknown in the European studios. So, too, is process cinematography. Paramount's Pant and London studios have, I believe, done a little of this sort of work, following detailed instructions from Fairport Edouard here in Hollywood, but elsewhere process work of any sort is unknown.

"The weakest point in the European film industry, however, is the laboratories. With the exception of the UFA laboratory in Berlin and the Paramount laboratory

Continued on Page 38

# The Dieterich Process for Composite Photography

by

William Stull, A.S.C.

A NOTEWORTHY contribution to the progress of composite cinematography has recently been made by Dr. L. M. Dieterich, A.S.C., member of the Society's Research Committee, who has developed the Dieterich Process of Composite Cinematography. According to Dr. Dieterich, this new process combines the major advantages of existing processes, while eliminating their principal disadvantages. It is simple, effective, and practical with existing equipment and materials throughout.

As is well known, the existing methods of composite cinematography (disregarding the multiple printing processes making use of the travelling-matte principle) fall into two general classifications, those making use of panchromatic color-separation and complementary-color lighting, and those involving the projection of the background-film on a screen behind the foreground action. The former presents a number of difficulties in the matter of lighting, and often gives rise to "ghosts" and "bleeding", while it also precludes any opportunity of seeing the background in motion as is possible during the making of projection shots. The latter, on the other hand, raises some difficulty

in the matter of graininess and even illumination of the field of the background plane. There is also some difficulty in getting a correct balance of focus between the actual foreground action and the projected background, a fault which can seriously jeopardize the desired illusion of reality in the composite picture.

In the Dieterich Process, these difficulties are held to be overcome, while the respective advantages of the methods are combined. Essentially, the process is based upon the principle of color-separation, yet it also permits the projection of an auxiliary image behind the foreground action, if this is desired.

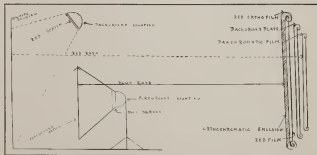
Briefly, the process involves the use of three films in the camera in front, an orthochromatic film with red backing—commercially available under the name "red-ortho" film—as used in normal back-color cinematography, with the emulsion to the rear; behind this, a positive print of the desired background scene, preferably printed on Eastman News Stock, and placed with the emulsion to the rear; third, a normal SuperSensitive Panchromatic negative film. These three films are threaded through the camera in contact with each other. A standard Mitchell shuttle will accommodate these three films without adjustment, in the Bell and Howell camera the required adjustment to the shuttle is easily made, as is common for commercial back-color cinematography. In either instance, the ground-glass focusing screen must be compensated by the insertion of a .006 in. sheet in front of the glass.

The background used is a plain white drop, illuminated with red light containing absolutely no blue or green. The foreground action, on the other hand, is illuminated with blue light containing no red. In the tests thus far conducted, these colorings have been produced by placing colored gelatin screens over ordinary studio incandescent lighting units. Any trace of blue passing the red filter, backing of the red-ortho or red passing the blue gelatine filter, will result in "ghosts" or other aberrations in the composite film. The same is true of reflected light from either source.

In practice, the method of lighting works as follows: the foreground, being illuminated solely by blue light, is photo-

Continued on Page 32

Diagram roughly indicating principle of the Dieterich Process.





Showing Synchronized Finder on New Bell & Howell Camera.

EVER since sound became stabilized as a basic factor in studio production, cinematographers and technicians have been repeatedly asking themselves and their fellows, "When is the new Bell and Howell camera coming out—and what is it going to be like?" These questions have at last been answered with the recent appearance in Hollywood of the new Bell and Howell Noiseless camera, which represents over three years of research and development, and an investment of more than \$300,000. The first of the new models is now in Hollywood, where it is undergoing practical tests at the hands of the Research Committee of the American Society of Cinematographers and the Silent Camera subcommittee of the Academy of Motion Picture Arts and Sciences.

Even upon a cursory inspection, the new camera reveals that it is designed for modern conditions, and it incorporates many features so advanced as to be well-nigh revolutionary.

In outward appearance, the new model departs considerably from established Bell and Howell design. It is rectangular box-form, roughly 10x12x18 inches in size, with the standard Bell and Howell 1000 foot sound-proofed magazine placed at the top. The turret has been eliminated in favor of an ingenious universal lens-mounting, and the 48-cycle motor is built into the camera-base, driving the shutter-shaft direct. Focusing is accomplished by means of a new optical system, and is done without shifting any part of the camera or moving the lens. The finder, which is equipped with built-in, adjustable field area indicators compensating for any lens from 24 mm. to 6-inch focus, is automatically focused and compensated for parallax in the normal act of focusing the camera. Lastly, but by no means least, the famous Bell & Howell stationary pike-pin registering movement, somewhat refined, has been retained.

Silencing has been secured by the elimination, wherever possible, of all unnecessary gearing, and by the use of special materials for the gears remaining. A tremendous amount of research and experimentation was necessary on this point alone, involving the experimental use of many unusual materials and provision for unusual methods of fitting the gears, some of which were cut most unconventionally. The pike-pin mechanism has also been silenced

## Hollywood

to a considerable extent, and the size of the film-loops reduced to the absolute minimum. The camera-case likewise contributes greatly to the noiseless operation, as it is built double, with the inner case containing the camera-mechanism, literally floating within the outer case. There is no metallic contact between the two at any point, and none of the moving parts of the mechanism are in contact with the outer casing. Sound-absorptive insulation is, of course, used in the construction of both casings and at certain points between the two.

No definite data as to the sound-absorption of this casing has as yet been released.

Access to the movement is had through two doors on the left-hand side of the camera, opening successively in the conventional manner, and through which the movement is threaded as usual. The movement is a modification of the familiar Bell & Howell registering pilot-pin movement, greatly improved and amplified. Two main sprockets are used in place of the one formerly used, and the intermittent has been altered to permit easier threading and servicing, though its basic principles and components remain unchanged.

The optical system of the new Bell & Howell is unusual, to say the least. The lenses are mounted in rapidly-interchangeable universal mountings controlled by a releasing lever placed beside the lens-socket. On each lens-mount is a special bayonet-pin, fitting into an opening in the camera's lens-socket; this pin compensates for the focal length of the lens and once in place, the lens is never moved for focusing. Instead of moving or rotating the lens, focusing is done by moving the entire movement of the camera, this is done by means of a knurled knob at the rear of the camera, operating also the large engraved focusing-dial conveniently placed at the center of the rear side of the box. This dial is engraved with a single set of calibrations which are absolutely universal for all lenses; compensation is made by the pin heretofore mentioned, in the lens-mount.

Visual focusing is done on a ground-glass screen which is moved into place in the aperture by operating a lever on the right-hand side of the camera which slides the movement backward, and automatically inserts the ground glass and the necessary reflecting prisms. The image is reflected across the camera, then straight back through a conventional focusing-tube on the right-hand side of the case, and is viewed, enlarged and right-side up, through an adjustable ocular at the right-hand rear side of the camera. The control-lever for this focusing system is placed hardly just below the magnifying tube and may be operated while the camera is running. The focusing-knob is very conveniently placed just below and to the rear of this lever.

The finder, as has been mentioned, is focused and compensated for parallax automatically, by the same mechanism that focuses the lens. Compensation for the varying angular fields of lenses of different foci is made in the finder by adjustable full vision field area indicators controlled by a single micrometer-adjustment. These area indicators are in the form of thin bars across the field, large enough so that they sharply demark the field in question, yet not so large that they will hide small objects—

# Inspects New Bell & Howell Camera

by  
William Stull, A.S.C.

such as microphones, etc.—which may be perfectly close to the edge of the picture. They also permit the operator to see what is going on outside of the field included by the camera's lens.

The new camera is powered by a 48-cycle motor which is engineered as an integral part of the camera and built into the instrument. Coolness of operation under load characterizes the efficiency of design of this motor. Care has been taken to assure that there may be no need of repairs or replacement under ordinary circumstances. Its rotor is an extension of the piggyback-shaft of the camera-shutter, and the only gearing used is that incidental to the driving of the sprockets. The starting and stopping controls for the motor are placed at the top of the camera, at the right-hand side of the case. An automatic throw-out is provided to guard against film-buckling.

The shutter is adjustable, though not equipped with a dissolving mechanism. The maximum aperture is 180 degrees, and adjustments are provided by which this may be lessened in inverse geometric progression, with each setting giving an aperture half the size of the previous one.

The magazines used are the standard though improved Bell & Howell soundproofed type, holding 1000 feet of film. Take-up is through a fabric belt, and an ingenious automatic tension-equalizer which is placed inside of the camera. There is no direct contact between the magazines and the inner camera-case which carries the mechanism. Magazines for bi-pack cinematography in natural colors may be fitted, and the shuttle is easily adapted for bi-pack work.

A special sunshade-matte-box is a semi-permanent part of the camera, and is used to aid in the noise-reduction, as the glass filters, diffusion-discs, etc., serve to baffle a large part of the noise which would otherwise escape through the front of the camera. When neither filters nor discs are being used, a sheet of optical glass is inserted in the filter-camera to serve this purpose.

As may be gathered from the foregoing, the new Bell & Howell camera is intended primarily for studio use. In this it very interestingly reflects the changes that have taken place in the industry since the appearance of its famous predecessor, Bell & Howell Standard Camera No. 1, in 1910. At that time, it will be remembered, studio work represented only a small proportion of the footage of the average motion picture production. It was the day of the exterior-made film, and accordingly the cameras of the day were designed with an eye toward their fitness

for field work. Today, location work is held to the absolute minimum, and when a company does leave the studio, there is always more than adequate transportation, a large crew of grips, etc., so that greater weight is permissible. Increased bulk, on the other hand, is definitely undesirable, due to the modern cinematic technique.

The Bell & Howell engineers have taken full advantage of these changed conditions. For while the bulk of the new camera represents only a negligible increase, the weight is considerably greater than was usual in the days before sound. This increase is necessitated by the double construction of the two floating camera-boxes, and by the other soundproofing measures. The weight of the new camera is stated to be in the neighborhood of 150 lbs., completely equipped and loaded, yet this figure represents a reduction of approximately 50 percent from the average weight of the blimps now being used in most studios. While the new Bell & Howell may be used on certain of the heavier tripods designed since the introduction of sound, it is primarily intended for use with the rolling tripods, perambulators, etc., which are now almost universally used; it is naturally engineered especially to form a semi-permanent unit with the recently-introduced Bell & Howell "Rotamulator."

The optical system, with the new method of focusing and the provision for complete interchangeability of lenses is certainly the outstanding development of the last decade in camera-design. In both design and workmanship, the new model lives fully up to the Bell & Howell reputation, which it should enhance. Following the tests which are now being conducted by the Research Committee of the A.S.C. and by the Academy Silent Camera subcommittee, it is understood that the new camera will be put into regular production and be made commercially available.

Focusing and  
finder details  
are indicated  
by A—Finder  
B—Focusing  
Aperture  
C—Focusing  
Throw-over  
Control  
D—Focusing  
Knob  
E—Universal  
Focusing  
Scale





# RIDDLE

# ME THIS

**The Riddle: Is it in your opinion advantageous to maintain a separate special-effects department, or would better results be had if the production cameramen handled all of the special-process work on their pictures?**

**DANIEL B. CLARK, A.S.C.** To my mind, the maintenance of a separate special-effects department is unworkable, especially so in certain instances I have recently experienced, in which the special-effects personnel have gone to absurd lengths to avoid cooperating with the production cameraman. After all, special-effects scenes are not individual scenes, but must be closely intercut with regular production work. As such, they should carry out the same technical and artistic treatment as does the rest of the production; therefore, they should be made under the immediate supervision of the production cinematographer, upon whose shoulders rests already the responsibility for the photography of the picture as a whole. Moreover, with the increasing amount of process work (especially projected-backgrounds) now being used in most productions, the production cameraman should certainly be able to handle any routine process work.

If the process work of a picture fails to match successfully with the regularly-produced sequences—whether or not the production cameraman had any say in making the process shots, he receives the blame; therefore it is only fair that he should at least be consulted during the making of these scenes, and preferably that he should be as much in charge of them as he is of the regular run of work.

This may be the case in some studios, but I have recently had a number of experiences with process departments which seemingly went out of their way to avoid cooperating with the production cinematographers. In the making of the process scenes for several of my recent productions, for instance, not only was I never consulted, but I was not even allowed on the process stage, and I understood (the results bear this out) that the process man did not even trouble to view the scenes which I had made, and which were to be used with the process shots. When my company went on location, a man from the special-effects department was sent along simply to make some backgrounds—plates which I—or any other production cinematographer—could have made equally well and at less expense.

Therefore I feel that the maintenance of a separate special-effects department is entirely superfluous, involving unnecessary expense, duplication of effort, impairment of the technical and artistic quality of the pictures, as well as unnecessarily shifting the authority for such work from the fast cinematographer, to whom it rightfully belongs, without any commensurate shifting of the responsibility for the ultimate results.

**FARCIOT EDOUARD.** Speaking as a former production cinematographer, as well as a special-process worker and department head, I feel that there is a real benefit to be

gained from the maintenance of a properly operated special-effects department. The entire trend of the industry is toward specialization. Pictures must be made faster and more efficiently than ever before—and on greatly reduced shooting schedules. If therefore a production can be scheduled so that the process work is held until the last, a much-reduced crew can be used for this, and only those members of the cast retained who are actually to be used in the process scenes, the rest can be closed out. It is a well-known fact that process work requires much careful planning, some of which is often extremely intricate; if this can be handled by a special-effects staff which need concentrate on nothing but this work, it is obvious that the process sequences can be done far more efficiently than if the production cinematographer had to figure everything out himself, and then stop production for experimentation, tests, etc., which the process staff can do (if necessary) while the regular crew continues with production.

There are many other features, less obvious to most of us, such as the importance of accurately-planned background-plates, perfect laboratory work, and so on, which, although not usually considered as part of the actual process of making process scenes, contribute vitally to the ultimate success or failure of every process shot. Such things are by all means best handled by a completely organized special-effects department.

On the other hand, no special-effects cinematographer or department can hope to succeed single-handed, for every process scene must fit perfectly into the picture it is made for, or fail in its purpose. Therefore, the special-effects technician must inevitably work in the completest harmony and cooperation with the production cinematographer in charge of the regular camerawork on a production. It is not enough that a process scene be acceptably photographed; it must carry out the same style and mood of lighting, the same type of composition, the same artistic and technical treatment as the individual sequence into which it is to be cut. To that end, the special-process technician will find it indubitably to his advantage to make every effort to have the production cinematographer in charge of a picture work with him on the set while he is making the process scenes for that cinematographer's picture. If each will do this, each making plan to the other just what his aims and problems are, both will succeed; the result of their joint efforts will be a production that one can be proud of, and process scenes that the other may rejoice in. If they do not cooperate, neither one will have anything in which to take pride—and the picture will suffer proportionately.

There is no need for misunderstanding between the production cinematographer and the special-effects personnel: both are working toward the same end, and each must rely upon the other for the cooperation that will bring complete success. If either of them cannot or will not cooperate with the other, he is hurting himself just as much as he injures the other man.

**KARL FREUND, A.S.C.** I feel that the policy of maintaining a separate special-effects department is ridiculous. It leads to undesirable confusion, duplication of effort and



No Filter

responsibility, and in all too many instances, to infer work. In Germany—and all through Europe, for that matter—the production cinematographer is invariably in charge of any special effects work, no matter of what sort, for his productions. This, to my mind, is the only logical method, for only the production cinematographer can know exactly what is wanted, and only he can perfectly match the treatment of the special-effects scenes to the treatment he has given the rest of the picture.

As a director, I naturally prefer to have the photographic responsibility for my productions centered upon one man, with whom I can work in complete cooperation and understanding from start to finish. As a cinematographer, I likewise prefer this unified responsibility, for I will naturally be responsible for all of the photography in any picture bearing my name, and if this responsibility is divided, it goes without saying that neither of us will do our best work. I firmly believe that the best results are to be had when the production cinematographer is given full charge of the process work in his productions, the work will be better and more efficient, while the result will be a more coherent artistic unity.

**ERNEST HALLER, A.S.C.** I feel that the best interests of both the production as a whole and the production cinematographer as an individual are served by delegating the special-effects scenes in a picture to a competent special-effects staff—provided the supervising special-process cinematographer and the production cinematographer can and will cooperate understandingly. If I can go on a picture with the assurance not merely that the special-effects work for that production will be executed by a competent individual, but by one who understands my aims and problems, and who will make a real effort to match his work with mine, I can start my work in a far better frame of mind than if I had to plan out all of the process work myself, or if I felt that the process-man and I were going to be at sword points wherever our paths crossed. Since I have been at the Paramount Studio, I have felt myself particularly fortunate in having the superb cooperation of Raoul Edouart and his special-effects department, who go out of their way to cooperate with the production cinematographers. Mr. Edouart invariably has the production cinematographer working with him when he makes the process sequences, and gives the production-man virtually a free

hand in the lighting, except as his normal lighting interferes with the requirements of the process being used. In such instances, since both men can see the problems from the same viewpoint, both can work together toward a solution of the problem.

**JOSEPH WALKER, A.S.C.** The system we use at the Columbia Studio might not work out so well in a larger and necessarily more intricate organization, but it has proven eminently satisfactory to us. In fact I have come to regard it as by far the best system possible. At Columbia, the production cinematographer has complete charge of all photographic work on his productions, and is aided when desired by special-effects men called in for definite sequences, such as miniatures, etc. In this case, the special-effects men are definitely under the production cinematographer, and the two work together in complete harmony. There is no regularly maintained special-effects staff, as such men are called in purely as consulting specialists. They may—and usually do—do the requisite proprietary work themselves while the production man is engaged in making the regular sequences of a picture, but in the actual photographing of the process shots they work under the direction of the regular first cinematographer. In consequence of the large amount of projected-background work done now-days, we do not consider this kind of thing as special-effects, but leave it entirely up to the production cinematographer throughout. It has worked out very successfully in practice.

**JOHN FULTON.** To my mind, the only answer is to see what the majority of the major producers are doing in every instance except one, there is a separate special-effects department maintained. Obviously, this is the most efficient method. In my own department, all of the work, from the making of the background-plates up to the actual photographing of the composite negative is handled by the special-effects department with perfect success. The only exceptions are when a very small amount of background-negative is necessary, and this must be made on some distant location, to which a company has been sent. In this case, the production cinematographer makes the background-plates under strict instructions from the process-department, and the remainder of the shot is handled exclusively by the process personnel. This procedure relieves

Continued on Page 36

K.S. Filter





Production still from "King Kong," made on a miniature set with a "Leica", reproduction from field enlargement.

THE paramount needs of the motion picture industry today are recognized to be efficiency, economy and salesmanship. Pictures must be made not merely better, but more efficiently, faster and for less money than at any time since the nickelodeon disappeared. Once made, they must be sold to a public which no longer has a property bankroll to spend for entertainment—a public which must be shown beforehand that the money spent at the theatre will not be wasted.

These are not problems for the executive and sales forces alone: they concern every individual in the studio intimately and personally. Therefore, it is up to the photographic departments to survey the field to see if there exist any new developments in either methods or equipment which would be of advantage to the cinema industry—which would add to either the efficiency or economy of production or in the exploitation of the completed production. Such tools have been offered in some profusion to the cinematographer, but the still photographer has not been nearly so fortunate; aside from the advantages incidental to the use of incandescent lighting and SuperSensitive emulsions, he has had to be content with the same equipment and methods familiar long before Griffith made "The Birth of a Nation."

During the past few years, however, there has occurred one revolutionary development in the field of still photography, which is—or could be—a tool fashioned expressly for the hand of the studio "still man." This is the miniature camera: a compact, precision machine which makes upon standard motion picture film negatives of a quality which permits almost indistinct enlargement, yet which by its compact size permits faster, more efficient work under all conditions, and by its fine optics and precision construction permits work under conditions where the use of larger, older equipment would be utterly impossible. The sensitive material used by the miniature camera—short lengths of standard motion picture film—represents not merely a definite saving in cost, but the utilization of a hitherto wasted by-product of every studio.

Under present conditions, the bulk and archaic con-

## Using the

struction of the still cameras today in use in the studios is a serious drawback to production efficiency: despite the personal efficiency of modern studio still men, there is a distinct loss of time inevitable to the use of a large 8x10-in. view camera which must be set up, often necessitating the moving of the cinema camera, focused, loaded, and then given an exposure which is—thanks to slow lenses—unduly long. Production is momentarily arrested, and the whole company held inactive for the several minutes necessary to the making of stills.

With the miniature camera, fitted with focal-plane shutters and lenses at least as fast as those used on the cinema camera, this is reduced to the absolute minimum: the still man need merely step forward, raise his camera, focus it with a single adjustment of a built-in range-finder-focuser, and snap his picture—all in a small fraction of the time required for the larger apparatus. Production may proceed within less than a minute if need be, or the still man may make a half dozen or more stills in the time ordinarily required for a single exposure. The use of SuperSensitive motion picture film and perfectly-corrected, high-speed lenses permits, moreover, very short exposures which will stop any normal motion, and result in far more natural-looking pictures. These same features also ensure a still which will perfectly match the scene as photographed by the cinematographer. Using optically identical lenses, the perspective and field of view will be identical; using the identical film (and, if necessary, the identical filters) ensures that the photographic quality—color-correction, lighting, etc.—will be identical on the screen and in the still.

The miniature camera is, if possible, even more useful to the maker of western and action pictures. It permits the making of progressive series of stills of the actual action of chases, fights, stunts and the like, which are invaluable alike for lobby display, publicity, posters and reference-work.

In connection with the use of stills for reference purposes, it will be remembered that Jackson Rose, A.S.C., writing in Volume 2 of "The Cinematographic Annual," discussed the use of the "Leica" miniature camera for the making of both filter tests on location and of reference stills to aid in the selection of locations.

A new and tremendously useful application of the miniature camera is in the making of publicity and other stills in sequences involving the use of miniatures and various types of special-process cinematography. For this use, such miniature cameras as the "Leica" stand unrivaled. In the first place, such scenes are almost invariably made under circumstances which would absolutely preclude the use of a larger camera; the available space is generally too restricted to permit the use of an ordinary still camera, and often one must work in such cramped quarters that even a small graphic is out of the question. The miniature camera, on the other hand, may be worked in any space large enough for a man—or even, in a pinch, in a space large enough for a man's hand and head.

But this is by no means the "Leica's" most important asset as an adjunct to miniature and process cinematography. These small cameras are fitted with lenses of the same foci and characteristics as those used on the motion picture cameras used in making the process shots; therefore,



# Candid Camera on Production

by

Walter Blanchard

they will faithfully reproduce the perspective of the scene identically as photographed by the production film-camera. This is an invaluable consideration in view of the fact that miniature work especially depends upon the maintenance of a very precise relation between the scale, form and color of the miniature and the lens, angle and perspective of the camera photographing it. This relation would be entirely lost—and with it the illusion of reality—of the still pictures are made with a large camera with a lens of many times the focal length of that for which the miniature was laid out. The same applies in a considerable measure, too, to such special processes as the transparency-projection process, and the like. In this connection, it would be entirely feasible to use a synchronizing gear combining electrical synchronization with mechanical methods such as the Fokker and Constantinesco synchronizers used during the war to synchronize airplane propellers and machine-guns, this would simplify the making of stills of projected-background scenes, by allowing an exposure only when the projector-shutter was open.

The small size of the negatives produced by these miniature cameras cannot be held to be any disadvantage, for it is possible, as has been proven repeatedly, to enlarge "Leica" and "Contax" negatives to 14x22 in. size or better with little if any loss in quality. At present the standard size of print in all studios, newspaper and magazine work is 8x10 in.—and miniature camera negatives can be enlarged to this size with such success that they are literally undistinguishable from 8x10 contact prints. In fact, 8x10 enlargements from "Leica" negatives are vastly preferable to the 8x10 enlargements from 5x7 negatives now used to some extent in all studios. Were all stills to be made with these cameras, laboratory equipment and methods could easily be restricted so that such enlargements could easily and commercially be produced on a production basis entirely comparable to contact printing. Neither the difficulty nor the expense of modern projection printing from small negatives is in any way greater than contact printing. In fact, such a practice would very likely simplify matters to a considerable extent, since the negatives made on one production could be assembled into a small roll, with the identifying numbers of the individual pictures lettered in the margin of the film. It would be simplicity itself, then, to thread this roll into a pre-focused projection-printer and turn out the needed 8x10 enlargements (in any quantity) in less time than would be taken for contact printing from 8x10 negatives. It is entirely possible, too, that a semi-automatic marginal numbering device could be built into the cameras.



Top—"Leica" portrait still from Chadwick production "Oliver Twist."

Center—Using the "Leica" for making production stills on "Oliver Twist."

Bottom—production still made with "Leica" as shown above.



The question naturally arises, why have not miniature cameras been used in studio production work? Surprisingly, the answer is that they already have—that they are already in regular use in several studios. On the recent Chadwick production "Oliver Twist," the "Leica" camera was used with excellent results for making action stills while the motion picture camera was making the actual scene. It is understood that the results were so eminently successful that this firm is planning to use miniature cameras extensively on all further productions.

Continued on Page 37



# PHOTOGRAPHY

## of the MONTH

### "KING KONG"

photographed by **Edward Linden, Verne Walker, A.S.C., and J. O. Taylor.**

"King Kong" is undoubtedly the most spectacular triumph of the special-process technicians since "The Lost World." Every trick process known to American technicians is utilized in it—Transparency projection, Dunning, Williams, Pomeroy and other transparency processes; Miniatures; glass matrices, optical printing, stop-motion, slow-motion, and every other method imaginable have been used, sometimes singly and sometimes in combination, to breathe life into the incredible story imagined by Merian Cooper and the late Edgar Wallace. At times, as many as six or seven different trick processes and methods are said to have been used together to achieve the realization of a single scene!

In the main, this staggering assignment has been very successfully carried out. Certainly most of the work is far ahead of anything of its kind yet seen. If any criticism is possible it would be that the last half-dozen scenes in which the Brododragon "Kong" appears should have been animated a trifle more smoothly, for they give a suggestion of the mechanical which is apparent even to the lay mind, and which is dispelled only with difficulty by the more perfect trick scenes which follow. It might also be mentioned that the animation of some of the long-shots of the dinosaurs suffer from this same failing, however the various battles between "Kong" and the various saurians, as well as those in which human beings take part are well-nigh perfect, and most convincing, as are all of the closer trick-shots. The use of projection shots for putting human actors into the scenes played with the gigantic prehistoric monsters and with "Kong," the gigantic fifty-foot ape, is excellent, and should furnish much food for thought to the advanced amateurs who enjoy attempting the macabre and outre in their own films.

### "SECRETS"

photographed by **Ray June, A.S.C.**

There can be no secret about the fact that in this picture Ray June has come forth with some of the best work of his noteworthy career. "Secrets" is, in fact, very close on a par with his memorably perfect "Arrowhead," which was undeniably one of the greatest examples of what one might term "cinematographer's cinematography" ever photographed. From start to finish, "Secrets" exhibits the same high level of both artistry and technique. It should be among the top-flight contenders for the year's cinematographic honors. It exhibits perfect taste and masterful technique throughout.

Frank Borzage and scenarist Frances Marion, too, deserve applause for truly camera-minded direction and script. If this production is carefully analyzed, it will be seen to be more nearly the ideal talking picture than anything yet conceived, for there is very little dialogue, and by far the major portion of the story is told pictorially, with the least of silent-picture technique which makes dialogue practically unnecessary—yet is never unnatural. Whether or not the

general public may realize it, the scenes in which Mary Pickford's baby dies is a superb bit of scenarizing, direction, and acting.

Since "Secrets" is so perfectly based on silent-picture technique, it is a picture which can be of the greatest benefit to the amateur cinematographer, director and writer. It is hardly possible to mention all of the scintillant examples which the studious amateur will find, but two will probably suggest the nature of the others. First there is the manner in which the westward migration of the pioneers is suggested by the use of montage—cleverly inter-cut close-shots of the feet of men, the hooves of horses, the wheels of covered wagons, with Mary Pickford and Leslie Howard shown occasionally in close-up on the seat of a wagon. These are all treated rhythmically and with the aid of an excellent musical score, while the westward progression and the lapse of time are excellently portrayed by changing conditions of weather and road. All of this was done for practically no expense, yet told the story of the westward migratory movement to perfection. It is completely adaptable to the use of amateurs. So, too, is the manner in which the aging of the pioneer characters is suggested by lighting and costumes rather than by make-up. In all of these concluding scenes the faces are kept in the shadow, and only their costumes and their postures and movements suggest age. Again an expedient adaptable to amateur purposes.

### "THE SIGN OF THE CROSS"

photographed by **Karl Struss, A.S.C.**

"The Sign of the Cross" is an interesting blend of the old and the new in screen fire—a typical debilitant spectacle produced with sound, and under the economic restrictions of today. There has probably never been such a film produced on a comparable schedule and budget. As such, it is deserving of more than ordinary interest, as it foreshadows the day when intensive preparation and intelligent production will bring greater efficiency to the making of screen entertainments.

Both dramatically and technically, "The Sign of the Cross" is a curious mélange of the outstanding and the ordinary. Some of the scenes manifest the superb beauty and vitality of the paintings of the old masters, while others are distinctly routine in their conception and treatment. In many of the scenes—especially in the latter part of the film—Karl Struss is at his brilliant best, yet he does not seem able to sustain this exalted mood uniformly throughout the production. Frequently too, long-shots and close-ups of the same action fail to maintain the same equality; this is especially noticeable in the concluding shots of the orgy sequence, when "Merula" has been taken from "Marcus" palace to the arena. There are two superb long-shots of Fredric March standing by the great gridded doors; these are two of the most effective individual scenes viewed in a long time, but interest with them is a close-up of March which, though an excellent, routine close-up, entirely lacks the superb touch of the two scenes with which it is used, and does not sustain their artistic mood.



K1 and No. 1 Diffusion Filter

The climatic sequences played in the dungeons of the arena are exquisite examples of Struss' powerful cinematography, almost equal in conception to some of the works of a Michelangelo. The orgy sequence, too, gains a deal of richness from Struss' camerawork.

The limitations of the budget are scarcely noticeable in the matter of production value. One would estimate that an unusually large percentage of every dollar of production cost has actually reached the screen. It is a crying shame, however, that financial considerations precluded the use of natural-color cinematography for at least the latter part of the film, if not indeed for its entirety. Never have I seen a production more ideally suited to Technicolor or Multicolor: lavish spectacle, with glowing, colorful costumes and the most sumptuous of settings—the whole simply begging for the dazzling touch of today's perfected natural-color processes. Color would, of course, have been especially a boon in the sequences at Nero's court and at Marcus Superbus' orgiastic revel, but there is not a single scene which would not have benefited greatly from the understanding use of color. And one cannot forget the beauty of the colored sequences in deMille's earlier "The King of Kings." At the very least, a more adequate use might have been made of tinted-base positive film. As released, the entire footage of the production was printed on "Cardifflane" stock, which detracted, rather than added to the beauty of the best scenes, and immeasurably injured the poor ones.

A great deal too much use was made of the moving camera, especially in the earlier sequences, though in the latter part of the picture this device was used effectively and with proper restraint. The climatic sequences of the production—those in the arena and in the dungeons below it where the little band of Christians awaited their turn to go out and be slaughtered—both photography and direction lent a degree of power to the action, but a far greater effectiveness could have been achieved had suggestion been substituted for realism in many instances, and had the Eisenstein montage-technique been substituted. Involving, as it did, so much of mass-effects, "The Sign of the Cross" could have been made infinitely more powerful had the director made more understanding use of rhythm—rhythmic motion, rhythmic cutting, and rhythmic interplay of dialog, sound-effects and scoring. It is unfortunate that in this instance greater use could not have been made of this basic principle of the cinema—especially when it would

undoubtedly have resulted in considerable economies in production.

#### "ROME EXPRESS"

photographed by Gunther Krampf.

"Rome Express" is a picture that should be seen by everyone connected with the motion picture industry: it is the first British picture thus released in this country which is entirely the equal of American production in every way, photographically, technically, and dramatically. The camerawork of Gunther Krampf, one of Europe's foremost masters of the camera, is superb throughout—the more so since 90% of the action takes place in the crowded confines of a railroad train. His compositions and lightings are excellent, and he does not adhere to the usual European custom of lighting his sets first for mood, and secondarily for the characters; he achieves a fine combination of visual mood and excellent personal lightings. This production, too, is the first European film to make any extensive use of the transparency-projection process, and since it is the custom there for the production cinematographer to handle all of the process work as well, Herr Krampf deserves another of Walter Winchell's orchids for this achievement.

#### "THE MASQUERADE"

photographed by Gregg Toland.

This production is beautifully mounted and beautifully photographed. Gregg Toland's handling of the dual-role sequences with Ronald Colman is particularly notable even in this day of fine photography. His effect-lightings and fog effects are also extremely fine.

#### "THE WOMAN ACCUSED"

photographed by Karl Struss, A.S.C.

Whatever may be said about the other phases of this production little criticism may be leveled at Struss' camerawork. It is excellent throughout, displaying fine feeling and his usual fine technique. There are several scenes in which his use of lighting, etc., commend themselves to the amateur. For example, in scenes (night-effects) made on the deck of a liner, he employs the supply reflections from water to suggest that the ship is at sea, not logical perhaps, nor technically correct, but very telling dramatically.



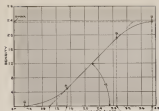


Fig. 19

## Explaining Film "Latitude"

by

Emery Huse, A.S.C.

### Part 22 . . . of "Principles of Sensitometry and their Practical Application"

THE word "latitude" is frequently used by both the cinematographer and the laboratory man but to each of them latitude has a different meaning. The cameraman thinks of latitude in terms of the ability of a negative emulsion to photograph light intensities covering a wide range. That film which can cover the widest range of intensities is said to have the greatest latitude. The laboratory man, on the other hand, thinks of latitude most frequently as a development characteristic. If an emulsion builds up contrast in development so rapidly that it is quite difficult to control during development, the laboratory man feels that that film has less development latitude, than one which can be handled with less precision and where a question of seconds of time in development makes no appreciable difference in the resultant quality. From the standpoint of sensitometry, however, the numerical specification of latitude is derived from the H and D curve and this latitude must be considered as applying to the cameraman's interpretation of the word. As a result, latitude is expressed numerically in terms of exposure units. From Figure 19, which was contained in articles 19 and 21 of this series, it is quite easy to point out just what latitude means from the exposure standpoint.

The complete sensitometric curve depicts the ability of

an emulsion under certain conditions of development to render densities of a relatively wide range of light intensities. The shape of the H and D curve shows whether or not those densities are building up at an ascending rate, at a constant rate, or at a descending rate with reference to the logarithm of exposure. The limits of intensity that a film can show under some specific development condition are naturally indicated by the minimum densities as shown by the H and D curve. However, as was pointed out in one of the previous articles, the difference between minimum and maximum density really constitutes contrast. What we are interested in from the standpoint of pure sensitometry is that portion of the H and D curve which shows density increasing in direct proportion to increases in log exposure—namely the straight line portion. In Figure 19 this range is contained between A and B. If from these two points perpendiculars are dropped to the log exposure axis it is then possible to readily determine the exposure difference between these two values. This difference expressed in exposure units and not in log exposure units gives the numerical specification of exposure latitude. It must be borne in mind that the determination of latitude sensitometrically makes use only of the straight line portion of the curve and it should not be construed that negatives giving densities which are not on the straight line portion are incorrectly exposed. Latitude for a given emulsion in a given developer will vary with development time. Latitude also is different for different kinds of emulsions even in the same solution. Negative emulsions which are of high speed and of low contrast have an extensive exposure latitude. On the other hand, positive emulsions which are slow and contrasty have a low value of latitude. For example, high speed negatives may show an exposure latitude of 1 to 1000, while positive emulsions have values not greatly exceeding 1 to 20.

It is often erroneously believed by photographers that the range of light intensities occurring in natural objects is very great and that in an ordinary landscape the sky is much brighter than the shadows. A bright landscape with heavy shadows often shows the sky only about thirty times as bright as the deepest shadows. Often open landscapes with no particularly dark shadows will show a sky brightness of only five or six times brighter than whatever shadows are in it. The range of light intensities, therefore, with which it is necessary to deal in ordinary photography will range from, let us say, 1 to 5 up to 1 to 50. Measurements have shown, under conditions similar to those described above, that the sky will have a measured brightness of from 1000 to 3000 foot-candles. This is the photometric brightness of the sky itself. However, when a photograph is taken of that sky it is not the brightness outside of the camera with which we are concerned but rather with those inside the camera, i.e., with the brightness of the image which falls upon the film. This brightness depends upon the aperture of the lens and it can be calculated from the fact that at an aperture of f/8 the photometric brightness of the image is about 1/100th of the brightness of the object being photographed so that the light from the sky falling upon the film will have a brightness of at most 30 foot-candles and the shadows will be represented by a brightness of about 1 foot-candle in a photograph of a landscape having a brightness range of 30 to 1. It is quite evident, therefore, that the latitude of negative film is many times greater than the light intensity range which it has to accommodate. This means that it is quite possible to give a wide range of exposures

Continued on Page 34

# HEIR TO 40 YEARS OF FILM EXPERIENCE

\*\*\*EASTMAN Super-sensitive "Pan"  
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# WHEELS OF INDUSTRY

● **WALTER W. Bell** and **Gordon S. Bennett** have formed the **Pellex Film Co.** of Hollywood. Under this firm name these two gentlemen will distribute the new 16 mm. reversal film under the brand name of Pellex.

According to an announcement sent out by this newly organized company Pellex is a finer grain film than now available in this sub-standard size; it is claimed to have ample speed for all ordinary light conditions and is sharply contrasty, giving definite whites and blacks. The announcement states that the light yellow filter can be used with this film to advantage. While the film is not recommended for interior work, it has given very fine pictures providing sufficient light is used.

Among the things this new company claims is a one-day service on the developing of prints sent to their laboratory.

Both Bennett and Bell have long been associated with the 16 mm. field. They are well known throughout the western states, where it is their intention to market this new film.

● **A NEW** type of Spreader lens which has been adopted by Victor Animatograph Corp. for use in the Model F0 Series of Projectors is said to give an increase in illumination when the projector is stopped for the still projection of single frames.

The spreader lens is mounted in a safety shutter which automatically drops into place between lamp and film when the operating lever is moved into "still projection" position. By dispersing heat with the spreader lens and automatically increasing the flow of air through the lamp house, it is possible to show an unusually bright still picture without danger of blistering the film.

● **THE Eastman Kodak Company** plans in March to begin supplying Eastman Super-sensitive Panchromatic Film in the form of "still" rolls and film packs of the most popular sizes. The emulsion offered will be of the same type as those which have found wide use on motion picture film, 16 millimeter motion picture film, cut film, and plates, since their introduction two years ago.

● **THE Eastman Kodak Company** has announced the completion of two new 16-millimeter projectors, with illumination, respectively of 500 watts and 750 watts. The Kodascope K, Models 50 and 75, as the new machines are designated, are said to set new standards for projection brilliancy.

● **LEICA** announces a new self-timer. With this automatic self-timer it is claimed it is now possible for the Leica camera user to include himself in any photographs desired. Exposures can be made from 15 to 60 seconds after setting the release.

Also, according to the latest Leica bulletin, that company is now equipped to convert the Model A and C Leica Cameras to the very latest model with built-in range finder and automatic focusing.

● **A NEW Continuous Projection Attachment** just announced by Victor is said to be the first device of this kind in which film breakage has been entirely eliminated and surface abrasion reduced to an absolute minimum. The Victor Continuous will be supplied in a standard model which will accommodate 400 feet of film, and special models can be supplied to accommodate even greater footage.

It is the claim of the Victor Animatograph Company that the method of film motivation employed makes the unusual performance of this machine possible. It is described as having a series of lateral rollers placed in radial position in the bottom of the attachment which keep every inch of film constantly in motion. The compensating action of these rollers relieves the film from tension, prevents binding and reduces surface to a minimum according to the report. An auxiliary feeding sprocket is said to obviate any possibility of strain being applied to the film when it is taken from the attachment onto the projector sprocket.

This continuous attachment is also equipped with a safety drop-switch which instantly and automatically switches off the electric current in any film emergency.

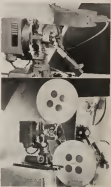
● **IN** the newly announced 1600 foot Victor projector, the problem of equalized tension is said to have been successfully overcome by an intermediate take-up unit which employs the slip-friction principle to automatically control the tension on any size reel.

The regular Victor Model 10FH Projector body and base are employed in this model. The 1600 foot reel arms, with pulleys attached, intermediate take-up unit, cut-out base-board, and special carrying case, may be attached and adapted to any Victor 10FH or 10RH now in use without interfering with its use as a regular 400 foot equipment. Changing the reel arms and attaching the intermediate take-up unit is said to be quickly accomplished by simply removing four screws.

The arrangement of the friction clutch and the reel-arm slip pulleys is clearly shown in the illustration on this page.

The industrial, educational, and religious fields will undoubtedly welcome this innovation.

The New Victor continuous projector and projector accommodating 1600 ft. of 16 mm. film





# AMATEUR SECTION

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- REFLECTORS "Home Made" In which Charles Clarke, A.S.C. tells you something about reflectors that you'll enjoy reading
- HERE'S HOW A page you'll not want to overlook. Amateur questions are answered by members of the American Society of Cinematographers



Leish, Withers  
adapt 16 mm.  
camera to  
aerial still  
aerial work.

THERE are, of course, a few precautions which must be taken in aerial cinematography. There is, for instance, the question of vibration being transmitted to the camera. With the heavy equipment used by professional cinematographers, this problem is not quite the same as that which confronts the amateur cinematographer. The professional depends, I believe, largely on the weight and bulk of his equipment to absorb vibration. I personally believe he is wrong in this, but that is only my opinion as I have had no practical experience with the large cameras. However, I have had experience with heavy still aerial cameras and found that the best means of obtaining good sharp pictures with them is to either hold the camera against the body and away from all metal parts of the ship or rest it in some manner on sponge rubber which is excellent for absorbing ship vibration. In the case of the amateur camera, the very best method possible, in my opinion, is to hold it firmly against the head in the same way as pictures would be taken on the ground where a tripod is unavailable. Not only is the body the best absorber possible against the vibration of the motor, but the flexibility of the body makes it very much easier to follow an objective in the comparatively small field of the finder, than if an attempt is made to use a tripod in a plane. Care should be taken not to rest the elbows on any part of the ship, as this will transmit vibration straight through to the jaws or head, against which the camera is placed. Let your contact with the plane be through as much of your body as possible. Kneeling or squatting on the floor of the plane will give the greatest amount of absorption. However, if seated in the plane, the additional comfort and flexibility obtained will probably overbalance any loss through absorption of vibration.

The question of angle is as important in the air as on the ground. Pictures taken at right angles to the line of flight are more difficult to obtain without movement than are those taken to the front, to the rear or obliquely to the rear. The type of picture which can be taken depends largely on the type of aircraft which is available for flight. The most handy and easiest pictures to take

## Using a

are those directly to the front, where the aircraft has a cockpit forward of the motors, as is the case with some transports, amphibians or seaplanes. The angle preferred on the tractor single motor type is an angular view to the rear so taken as not to include the wing or tail surfaces.

As to the subjects for aerial photography, I must take sharp issue with the usual conception of motion pictures which I have seen so often repeated, that motion pictures must include motion. Although this axiom is doubtless true to a large extent on the ground, I do not believe that it holds particularly in the air. In the air, motion is supplied by the aircraft. The camera is travelling. The scenery that unfolds below if one is taking pictures of the ground, gives ample motion. As scene after scene unfolds, it will be found that the portrayal of scenic beauty by motion pictures from the air gives a new thrill never to be attained by the use of single slides. One has a gorgeous and little explored world for cinematography here. With the facility with which aircraft can leave the beaten path and search out the hidden wonders of the wilderness, there lies before those who have the opportunity many pleasant hours of taking scenic shots and many more of exhibiting them.

In the taking of pictures of the ground, several considerations should be borne in mind. The angle from the ship I have touched upon. The angle toward the ground from the plane is equally important. Do not get your angle too steep. In general, the oblique view from the plane should be as flat as possible. From twenty to thirty degrees from the horizontal is best. This gives an angle to which people are more or less accustomed. A steeper angle will look unnatural to all those who have not had extensive experience in the air.

As to speed, it will be found that 16 frames a second is rather slow to adequately take ground scenery. This is not so much caused by the relative speed between the plane and the ground as it is by the erratic up-and-down movement of the plane in relation to its flight path. These "bumps" are brought about by the rough air and various currents of different temperatures to be found near the surface of the ground. The only way to cure this is to shoot your pictures at better than normal speed. I have obtained some very good pictures of the ground at 24 frames a second, 32 frames is even better. If one is taking short shots of different scenes, such as particularly interesting sections of a city or waterfront, it is just as easy to take them at 64 frames a second if your equipment permits. The effect when shown gives the impression that the pictures were taken from a very slow aircraft. All "bumps" are ironed out and the picture is crystal clear. If there is movement present on the ground, such as people walking, automobiles and the like, their slowness is not particularly noticeable. One must accustom oneself to the difference in speed so as not to waste the film. Pictures should be taken as close to the ground as possible, the same principle applying in the air as on the ground, that is, the closeup is more interesting than the long shot.



# 16 mm. Camera In the Air

by

**Lieut. R. C. Wriston.**

Air Corps

A pursuit plane at Bolling Field, photographed by Lieut. Wriston.



With reference to the photography of objects in the air from aircraft. Here your problem is even simpler than the photography of ground objects from the air. With the co-operation of the pilot you can place your camera wherever you like in relation to the object photographed. If it is a formation, you should be ahead and either below or above and to one side of the formation. In as much as your speeds are relatively the same, such pictures can be easily shot at 16 frames a second if care is taken not to permit vibration in the camera. An effective shot of a formation flight can be obtained by flying up one side of the formation, getting a bit ahead of it and then swinging across the direction of flight and perhaps one hundred feet above it. This will bring all the ships under you and preserve their relative position. Pictures of this kind naturally require the utmost cooperation from the pilot. In reality he is the photographer. All you do is hold the camera and push the button. The pilot can, where considerable speed is necessary to get into the proper position for photographing an aerial formation, reduce the chances of movement in the picture due to vibration to almost zero by idling his motor and gliding while the picture is actually being shot. This reduces vibration to the minimum and leaves the only problem the question of speed.

The photography of other objects in the air is a very interesting pastime. To take a picture of a transport plane, of an autogiro, of free balloons or dirigibles, is a simple matter, if one travels in the same direction and takes pictures from the angle previously mentioned. Some added effects can be had by using the higher speeds when available. I recently had the use for a while of a 16 mm. camera shooting at 128 frames per second. With this some highly interesting shots of an autogiro were obtained. The huge vanes practically stopped revolving. The propeller turned over very slowly and it was difficult to see what was sustaining the autogiro in flight. The field of aerial cinematography has scarcely been scratched. For instance, the photography of clouds is an absorbing subject and where can one better arrange cloud subjects than from the air? With the use of some good cloud material, exceedingly interesting trick shots can be made by the rephotography of aircraft on the same film. If careful track is kept of the footage and composition of each shot, this type of work will not be found too difficult. If one is using the negative-positive method, and has the facilities of a printer, it is even easier to arrange.

I suppose I should touch briefly on the use of filters for aerial cinematography, although I hardly feel competent to touch this subject. In general, it might be stated that

where you would use a filter on the ground, you would also use one in the air. If anything, the filter should be deeper in the air than on the ground as here its primary function is to cut this haze. In the photography of ground scenery from above, I have used a K-2, K-3 and the Aero Minus Blue filters with excellent results. I have also obtained excellent results with no filter at all, using the Eastman super-sensitive panchromatic film. I am conscious of the fact, however, that I am not "up" on my filters. I was very interested in the article by Hal Mohr, A.S.C., on super-sensitive 16 for exteriors, in the August number of the "American Cinematographer." I have ordered all the filters recommended by him and am going to give them a thorough test with 16 mm. equipment in the air. I am sure that even better results can be obtained after one gets accustomed to these new filters.

When working from open-cockpit ships, things are rather more difficult than when you are in a closed or transport ship. There is, for instance, far less choice of position but if possible, take the rear cockpit (if you can persuade the pilot to fly from in front). Your angle of unobstructed view is much better from this position, you are far less likely to find unwanted bits of the wings and tail of the machine bobbing into and out of your picture. In working from an open ship, some special caution is necessary. Keep the camera as well shielded from the slip-stream (the blast from the propeller) as you possibly can. Otherwise, this powerful blast of wind is very likely to make it impossible to hold the camera steady.

It should not be thought that the aerial cinematographer is only available to those in the flying services. With the many aircraft in use commercially nowadays, it is possible to get the aerial pictures you want at a very small cost if they are in your vicinity. If you are travelling, try the air route. Arrange with the pilot in advance for a seat suitable for photography, where you can use a window. Ask him to approach other aircraft in flight and objects of photographic interest as closely as his instructions will permit. Although it is not so essential as on the ground, due to the angular view, it is still best to be on upward side of the object being photographed. Bear this in mind when reserving your seat in an air transport. In photography from air transports you can make effective use of long focus lenses. The use of long focus lenses at least up to and including the 4 inch lens, is entirely feasible. I have used all these lenses from the air and have had very little difficulty in subduing movement.



The market offers many devices for making your own titles.

## When You Title Your Own

by

**August Wolfram**  
*Amateur*

**I**F YOU have not as yet attempted to make your own titles you have been depriving yourself of one of the joys of the cine enthusiast. After you have delved into this aspect of cinematography for some time you will find this work as interesting as filming scenes. Just roll up your sleeves and get to work. You will discover that it is really play and not work.

There are a great variety of things which the amateur may choose upon which to make his titles. The market offers many devices. There are black boards backed with cloth which have slots into which white celluloid letters are placed. Metal letters with prongs can be obtained which are stuck onto a board. In a similar manner the market offers large wooden block letters which are manufactured colored beside white enabling colored titles to be produced. Another device utilizes magnetism in holding the letters to the board. To greatly simplify the problem of securing titles we can employ title stands. These contraptions make possible the use of small cards. A supplementary lens enables close focusing to the small card. With such a device, typewritten titles will produce good results.

Some of us will prefer to letter our own cards. No, it is not so difficult as you may think. If you cannot develop a "knack" of making good titles with a brush the speed-ball pen will come to your rescue. It can be obtained at any large stationery store. By the way, if you intend utilizing a brush do not get that tool at the ten cent store. Invest a few more cents and obtain a sable haired show-card brush. The difference in results produced will be quite obvious. The letter type is manufactured for the use of professional letterers and show card writers. It produces a smooth, clean cut letter if properly handled, and that can be easily learned with a little practice.

As you have no doubt noticed in the professional theatre, the best plan for titles is to have a white or light colored letter against a dark colored background, instead of a dark colored letter against a light background. Due to one of the characteristics of human vision, the white letter against the black background stands out better and is more easily read. It is not necessary to have pure white letters painted upon black cards. Any number of differently designed and toned cards can be chosen as long as the principle of light letter against a dark background is carried out.

There is one exception to this rule and that is in photographing direct positive titles. In this form of title we develop our film as a negative and employ this negative as the finished title. Therefore we must deviate from the above principle and employ dark letters against a white background. In the direct positive title (which is really a negative) we will have reproduced white letters against a dark background.

If you are desirous of obtaining better results and wish to introduce some designs in your titles remember that the same motif of design should be carried in all of the titles for that specific film. A different design for each title would only produce inharmonious results. The main title may be elaborate if you desire it so. The sub-titles should all carry a similar simple decoration. The decoration can be drawn upon a piece of celluloid and placed upon each lettered card, or it can be made as a cut-out and placed upon the card when it is being photographed.

The next problem is photographing the title. Either daylight or artificial light will serve the purpose. If you are utilizing artificial light you must take precaution to obtain even illumination over the entire card. This is difficult with a single lamp. Should your equipment be so limited the best position for the light is above and slightly to the rear of the camera so that it just passes over the letter and falls upon the card. Take care to prevent any direct light from being cast into your lens.

Two lamps would yield better results. The tubular type of bulb will give a better diffusion of the light. Provide them with reflectors and place one on each side of the title. This will insure that each portion of the card will receive an equal amount of illumination. One exception to such a precaution should be mentioned and that is when using block letters. In this case side lighting would produce better results for it will bring the letter out in relief. Do not attempt to guess at the exposure, employ an exposure meter.

The amount of illumination will be dependent upon the equipment you possess. If your camera will allow eight frames to be exposed per second instead of the regulation sixteen your illumination can be cut in half, etc.

Here is another precaution which you must bear in mind. The center of the card should be directly opposite the center of the lens, and the four corners of the former should be at an equal distance from the objective. This is necessary to insure freedom from distortion in the finished product. If you intend indulging frequently in home title making it would make your work much easier if you were to build some device which will hold the cards properly in relation to the position of the camera.

Accurate focusing is essential. It is best to employ some device as a focusing prism. This little device slips into the film channel occupying the same position which the film normally does. It enables you visually to focus the lens. Stop down your lens even if it does necessitate an increase in the amount of illumination employed. It will produce better definition and contrast.

The next consideration is the type of film to use. Positive stock will by far produce the best results. This type of emulsion is used to produce prints from negatives when

Continued on Page 34

# When a Professional Turns Amateur

by

David Abel, A.S.C.

I DON'T know where the idea that the professional cinematographer is more fortunate than the amateur originated—but I can say from experience that it's all wrong. The professional must, first of all, work on a commercial scale, with time, money and such things always more or less restricted to the end of turning out a profitable picture. The amateur has all the time in the world even if he may not have the bankroll of a big studio. He need not worry about commercial requirements; he is free to bend his efforts toward turning out exactly the type of picture that appeals to him. But the most important difference is that the amateur doesn't know what he can't or mustn't do—so he frequently goes ahead and does the impossible. The professional, on the other hand, is hedged about with a tremendous wall of precedents, traditions, and "don'ts." He may want to experiment, but between tradition and the commercial requirements already mentioned, he is pretty well held back from attempting anything he isn't positive will work.

That, I think, is why so many of us who spend our working hours as professional cinematographers are becoming 16mm amateurs during our leisure moments. Many of us in the A.S.C. use 16mm apparatus for experimental work as well as for personal enjoyment. I know of several instances where professional cinematographers have evolved effects and special processes in their 16mm experiments which they have later incorporated bodily in their studio work. And there is at least one feature production now in work at one of the major studios which is using 35mm enlargements from amateur-made 16mm scenes for important atmospheric scenes.

And, after all, why shouldn't this be the case? The better 16mm equipment used by the amateur of today is far superior to the professional equipment of only a few years ago. Take, for instance, my Victor camera: it is light, compact, and precision-made throughout. It has a 205 degree shutter, and can be fitted with a battery of lenses of any focal length from 15mm. to six inches or more, working at apertures ranging from f 2.5 to f 0.95, which may be focused by scale or on a ground-glass screen. It takes highly-corrected Super-Sensitive Panchromatic film, or Kodachrome for perfect natural-color pictures. It has a range of speeds from half-speed (8 frames per second) to ultra-slow-motion at 72 frames per second, and may be driven at these speeds either by a powerful spring-motor or by hand. Its capacity of 100 feet of 16mm. film is equivalent to over 250 feet of 35mm. film. Yet it weighs only three or four pounds.



David Abel,  
A.S.C.

Now, let's consider the professional cameras which were the acme of perfection twenty years ago when I entered the professional field. The motion picture industry had begun to gain recognition as a true industry; it was becoming fairly well stabilized, the experimental and pioneering days were over for so we thought then. The Motion Picture Patents Company had just been dissolved by order of the Supreme Court, and with it an attempted monopoly on cinema equipment. Griffith had put over \$100,000 into making "The Birth of a Nation." And a friend had persuaded Griffith's cameraman, Billy Bitzer, to try to make a cameraman out of a young amateur named David Abel, who, while in college, had built his own camera and taught himself how to make, develop and print motion pictures.

When I started work under Bitzer at the Fine Arts Studios that day in 1913, both equipment and methods were far more crude than the amateur standard of today. We had, perhaps, passed beyond the huge, non-focusing cameras of the earliest days (some of these cameras weighed hundreds of pounds), and were working with such "advanced" cameras as the now obsolete Williamson, Emerson, Pittman, Moly and others. These were large, wooden boxes holding 200 feet of film in separate magazines or reborts built inside of the camera-box. They were, of course, cranked by hand, and had shafts for eight pictures per turn (which at the standard cranking-speed of two turns per second gave sixteen frames per second) and one frame per turn for trick work. Few of these cameras could not be cranked backwards, and fewer still had any sort of dissolving shutters or fade-out mechanisms. As a rule, but one lens—usually a one-inch (50mm.)—was used. Although I have heard that in the very early days some cameras had the lenses permanently set at 25 foot focus, the camera I worked with all focused on the film, though the film could in some instances be removed and a small ground-glass screen put in the aperture. The fastest lenses known worked at only f 4.5—and most of us used lenses of f 5.6 or less. The film, of course, was slow and was not corrected for colors as present day panchromatic and super-

Continued on Page 35

# Protecting the 16 mm. Investment

by

William Stull, A.S.C.

SOMEbody ought to write an arithmetic book for some home-movie makers—one of those things we used to have in the third grade with problems about the six pigs John Jones bought from Merriam Swinehers for 4c a pound and sold for 6c per lb., making a profit of \$700 on the deal. I know a lot of amateurs who could learn a lot of good, common-sense photography if they'd study their movie-making from the third-grade arithmetic angle.

For instance there is the fellow whose films I saw yesterday. He's a big engineer and business-man—a college graduate, who knows all about differential calculus, logarithms, and the stresses in the Empire State building during a gale. But he doesn't seem to understand the simplest kind of home-movie third grade arithmetic. His films proved it. There were three nice rolls of Panchromatic film, so fresh from the processing plant that you could almost smell the developer. Three hundred feet of what should have been good pictures. Unfortunately, though, at least two thirds of that footage was badly underexposed—with an occasional overexposure to break the monotony.

He was being economical: these were hard times, so he was struggling along with only a \$300 camera, fitted with an f 3.5 lens, no speed lens, and no exposure meter. He was using about two rolls of film per month—Panchromatic film—making a total of twenty-four rolls a year.

Now, let's look at this from the viewpoint of the third-grade arithmetic student, if John Jones uses twenty-four

rolls of film each year, at seven dollars a roll, and wastes two thirds of each roll because of faulty exposure, how much is he saving by not getting a \$15 exposure-meter?

As nearly as I can remember my third-grade arithmetic, the answer to this problem would be that since John Jones uses \$168 worth of film every year, and wastes two thirds of this from poor exposure, he is wasting \$112 worth of film every year. If the exposure-meter costs \$15 (and even the best ones don't cost above \$30), he is wasting enough money each year to pay for seven and a half exposure-meters!

That, however, won't help him out much if he insists on making pictures under conditions where the light is too poor for his f 3.5 lens. An f 1.8 lens is five times as fast as an f 3.5 one—and an f 1.3 is ten times as fast. Either of these would permit him to make satisfactory pictures (especially with SuperSensitive film) under almost any condition other than absolute darkness or indoors. Such a lens would cost in the neighborhood of \$60. What would our third-grade arithmetic say to this?

Well, we know that John Jones uses \$168 worth of film each year, and wastes \$112 worth because he hasn't the means of exposing properly. Therefore, granted all this, he is annually wasting enough film to pay for either of these lenses, with enough left over to give him a good exposure-meter, a Kodascope equipment, some lights, and several rolls of film!

And yet my friend who knows all about differential calculus and the stressing of Brooklyn Bridge couldn't see this because of the first cost of the lens and exposure-calculator. In other words he would willingly gamble a lot of money on film he couldn't be sure of, but he was afraid to spend 9 percent of the money he was wasting through bad exposure even though that additional expenditure would give him perfect accuracy! He was unwilling to spend perhaps 10 percent of the total cost of his outfit on a speed lens that would increase its flexibility 100 percent!

People often ask me the questions, "Are exposure-meters sufficiently accurate to be worth-while?" and "Is a speed lens necessary?" If they'd only consider things in this third-grade arithmetic manner, they'd find their questions half answered, especially if they extended their figures to cover the five or six years that the average amateur uses a single outfit. Even if an exposure-meter was only 50 percent accurate, that and the extreme latitude of modern 16 mm. film and the reversal process should cut the wastage from incorrect exposure down to a negligible figure. And the better modern exposure-meters—especially the photo-electric ones—are better than 99 percent accurate. Last year I made a test of such meters under professional conditions, checking with the exposure actually being used on ten different studio-sets. The average of the meter readings was 4.248 while the average of the actual exposures was 4.256—the difference being caused principally by two companies which were making night-effect scenes, for which the meter could not make allowance.

It must be admitted that professional cinematographers seldom use an exposure-meter but this is due partly to the nature of their work, which allows them to control the light almost completely; and partly to the long years of experience by which they have trained their eyes and judgment so that they can estimate the actual value of the light—either natural or artificial—to within a small fraction of a stop. This is not impossible for the amateur—but until he has worked for many years, and exposed hundreds of thousands, perhaps millions, of feet of film, he cannot hope to attain the accuracy of the professional. The only thing, therefore, is to get an exposure-meter, of which this experience is an integral part—and trust it, even though his own experience and instincts urge him to do otherwise.

A speed lens is in most instances a positive necessity. It opens up a vast realm of work denied to the ordinarily-

Continued on Page 33



Good pictures are insured with the use of the exposure guide as your camera or instruction book . . . and with exposure meters.



Carl B. DeMole studying the continuity of "Sign of the Cross."

## You're Surrounded With Continuity

by

**T. B. Hoffman**

Winner of prize for  
"Ideal Home Movie"

**P**ICTURES without continuity lack common interest—they have no motive, no development of purpose, they tell no story. They bore your friends.

Some day you'll make the discovery as I did that the individual or individuals of your interest whom you may wish to film are continually giving you story material by their natural acts, and these, of course, serve as the best record of those close to you. All that is necessary is to observe them and make a few notes of their antics and you have a story. Soon after this realization dawned on me an opportunity presented itself.

Our little boy James received a fireman's suit with a hat, badge and all the other trimmings for his fourth birthday. The outfit, of course, suggested he play fireman. Carefully observing his antics, and suggesting a few to him, a short story presented itself, a synopsis of which follows.

A pedestrian having lit his pipe carelessly, throws away the burning match which falls into a trash pile and starts it burning. A young lady, whose playhouse is being threatened by the growing fire, discovers the same and calls the fire department. The one man department dispatches himself to the scene of the fire with all the speed any fireman could be capable of, and with all a fireman's technique promptly puts the fire out. The lady expresses her ex-

trême gratitude by embracing and kissing her hero, and that's that.

In order that this little story be properly photographed in continuity, it must be broken down into a series of shots, or scenes. When completed and cut together, they will project smoothly and give a pictorial account of the story. It was broken down into the following scenes:—

Scene 1 (Close shot) A man lighting his pipe, and starts walking out of scene, carelessly throwing the still burning match away.

Scene 2 (Close shot) Trash pile into which falls a burning match and conflagration begins.

Scene 3 (Long shot) A lady discovers the fire back of her play house and excitedly runs into the house.

Scene 4 (Long shot) Fire House (the family garage) with the fireman sitting at a small table in the foreground, which table is equipped with a telephone, some papers, etc. In the background stands his auto. He is looking over the papers on his desk when the phone rings, he answers, connects, hangs up the receiver, and hurriedly puts on the characteristic fireman's hat, jumps into his little red auto and drives it out of the scene. (Exit left).

Scene 5 (Long shot) (Camera set at half speed so that action will be twice as fast when projected) Driving the car at break neck speed the car enters the picture (Enter right) runs a considerable length on the sidewalk in front of our house and turns into a driveway exiting from the picture. (Exit left).

Scene 6 (Medium shot) (Enter right) Car enters picture, drives up to water faucet with hose attached. The fireman jumps out of his car, takes business end of hose in one hand and starts to open the faucet with the other.

Scene 7 (Medium long shot) Large fire in the foreground with the fireman turning on the water in the background. Water emerges from the hose and he starts forward, pours water on the fire, which is soon extinguished. A lot of smoke and steam add a lot to this scene.

Scene 8 (Medium long shot) Smoldering remains of fire and fireman in the foreground, the lady standing admiringly by her house in the background. She advances to and embraces her hero, and we are forced to assume that they live happily ever after.

Note: References have been made in several scenes to the entrance and exit of the character or object of our interest. This assures smoothness of action and prevents a character from bumping into himself coming in to a succeeding scene.

After the various scenes had been shot it was comparatively easy to match action and to cut and cement them together. We had a picture that ran smoothly without jumps, told a story and needed the insertion of no subtitles. Primarily, it gave us a record of our little boy at the age of five years. The title was made by pasting black letters spelling out the title on a pane of glass and placing this on the hearth in front of a brilliant paper fire in the fireplace. The camera was placed so as to silhouette the title against the background of the bright moving leaping flames which gives the picture an animated title, a moving title in good character with what follows.

We have enjoyed seeing this little picture time and time again, and guests in our home have actually asked to have it run. Story and continuity had done the trick. You must have a story to make a motion picture of general interest.

I have practiced this general method of exposing film ever since and get much more real enjoyment from my hobby than I thought possible. It has opened an immense field for more complicated attempts.



## Books the Amateur Should Read

by  
Karl Hale

SOME want to know what this thing "photography" is all about. The many inquiries coming into the office of the AMERICAN CINEMATOGRAPHER would indicate this is a moot question with many amateurs.

We made a survey among some of the members of the American Society of Cinematographers for their advice as to what books the amateur should own or read to give him the fundamentals of photography and cinematography that would permit him to make pictures with an understanding of what he was doing. Of what happened in the camera. What took place in the laboratory with a liberal quota of information sprinkled in on lights, color, lenses, exposure and the conditions that surround picture making whether still or motion.

We wanted to bring these books down to a minimum, but at the same time have them contain all of the elementary essentials.

They are seven in number and can be bought at practically every store handling photographic equipment.

Here is the list of books and their prices:

"The Fundamentals of Photography," by C. E. K. Mees, D.Sc., \$1.00.

"How to Make Good Pictures," 50c.

"Elementary Photographic Chemistry," 50c.

"The Photography of Colored Objects," 50c.

All of the above books are publications of the Eastman Kodak Company.

"Wellcome Photographic Exposure Calculator" 75c.  
Published by Burroughs Wellcome & Co.

"Cinematographic Annual" Volume 1, \$2.50 and "Cinematographic Annual" Volume 2, \$5.00. These two books are published by the American Cinematographer.

While "Fundamentals of Photography" predates present fast films, it still contains vital information on the basic principles of photography. It is written in such clear and concise style that it is worthy of a prominent place in your shelf of photographic books. Although some of the phases it touches are covered in the book "How to Make Good Pictures," still the treatment in both books is sufficiently different to give you a broader conception of the subjects covered.

Some may wonder why the book "Elementary Photographic Chemistry" was included in view of the fact that these developing their own films are very much in the minority. A clear understanding of what takes place in the laboratory is not only essential but helpful. You learn through a study of this subject just what might be done with chemicals, how a scene can be intensified or otherwise treated to bring about the best reproduction.

While you may never develop and print yourself, still if you are after a particular effect in your films, have kept a clear record of the scene you wish to bring out in a certain way, and take this information to the man in the laboratory you are giving him assistance that will help him to give you the results you are trying to attain. The deeper you get into photography or cinematography the more vital you will find this information and the more valuable it will prove to you, especially if you are using the negative-positive type of picture making.

"Photography of Colored Objects" is going to give you some very valuable data on what happens to color on your negative, how to change the tones and secure a pleasant and desirable contrast by the use of filters. Color is all around you, you must know something of what happens to it after it is exposed to your film in order to get pictures that will give you the fine satisfaction that achievement of a good result will always give one. It tells about the nature of color and the sensitiveness of the eye and photographic materials to colored light and many other phases of color in photography what will prove highly enlightening.

"The Wellcome Exposure Calculator" will be worth many times its price to the man who uses neither exposure meter nor the guide furnished him with his camera which contains the exposure chart.

This little book has in addition to the exposure calculator in its inside back cover a table giving light conditions for each month in the various latitudes. It also has the factor of many different types of films. These two items form the basis for the correct calculation of the exposure. In addition to this it has many other tables including a focusing table and developing information that may prove of interest to many photographers.

While the above books pertain mainly to still photography, still the principle that prevails in the still camera also holds good in the motion picture camera. However, the motion picture camera with its many possibilities widens the scope of photography that through the many years of experience of the members of the American Society of Cinematographers vital scientific history was built. Information gathered and experiments made that have now become a part of cinematography.

It is for this reason that in the books recommended to the man using a motion picture camera the two annuals

Continued on Page 34

# As Important



*as the Brakes  
on Your Car!!*

*I* T WOULD BE SILLY to buy a car without brakes. To invest in a motion picture projector that has no provision for protecting film from damage is almost as ridiculous.

Only VICTOR, however, has been ingenious enough to provide this unflinching protection at the four vital points in a projector—including the patented device which automatically strips mechanism and cuts off light in all film emergencies.

Mr. N. E. Brock, Brooklyn, N. Y., is one of many thousands who have learned the true value of such protection. He says:

"I made a 100 foot film which turned out so well that we decided to have it duplicated at once—but neglected to do so until after the film had been through our VICTOR over 150 times. Thought it a bit foolish to order a duplicate after using the film so much, and it was with grave misgivings that we started projection of the duplicate. We were speechless with amazement and delight when perfectly clear, sharp pictures flashed on the screen. There is not a scratch or sign of wear of any kind visible, and values are quite as good as in the original."

No VICTOR projector has ever broken, mangled, or otherwise mutilated a film, but Film Protection is only one of several exclusive features that VICTOR provides in addition to superior projection and distinctive beauty of design.

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*The* **WORLD'S FINEST 16MM MOTION PICTURE EQUIPMENT**



**KODACHROME LIGHTING.** "It's back-lighting impossible with Kodachrome! Also, what is the best general lighting for making Kodachrome scenes?" —J.V.L., Oakland, Calif.

With the original Kodachrome film, back-lighting was absolutely impossible, largely because the emulsion lacked sufficient speed to give any detail in the shadows with such lighting; there was—and is—also the danger of flare if the direct sunlight strikes the lens or the Kodachrome filters. This is easily overcome by the use of a very deep lens shade such as the Coerts effect device or the H.M.S. surshade. With SuperSensitive Kodachrome, backlightings in Kodachrome are not only possible, but very effective when used in closeups. One must, however, shield the lens from the direct rays of the sun, and remember to expose for the shadows rather than for the highlights; reflectors are a great advantage in this, as they enable one to balance the lighting better.

Generally speaking, the best results in any type of color cinematography follow the use of a flat front lighting; that is, with the light coming from very nearly straight back of the camera. Cross-lightings, with the light coming from the side, though effective in black-and-white cinematography, are not so good for Kodachrome long-shots, although they are excellent for closeups of people. Backlightings are the least effective in colored long-shots, although they are sometimes effective in closeups. Reduced to a simple statement, one can say that the best Kodachrome—the most brilliant coloring, etc.—is always secured by using a flat front light for all scenes, but that in closeups both cross-lightings and backlights are permissible—and if properly handled—often quite attractive.

A. L. Gils, A.S.C.

**THE X FILTERS.** "What are the 'X' filters; what are they used for?" —E.K., Los Angeles, Calif.

The Eastman Kodak Company makes several types of Panchromatic emulsions for still and motion-picture photography; these emulsions are intended for different

# HERE'S HOW

by A. S. C. Members

uses, have different characteristics, and require different filters. They include one class of regular panchromatic emulsions, another of panchromatic emulsions (principally for commercial still photography) with a high green sensitivity, and a third class which is characterized by a high red sensitivity. The "X" filters are intended primarily for use with the second type, with the high green sensitivity.

The "X-1" filter is intended for use with the highly green-sensitive "Red Label Portrait Panchromatic Cut Film" with tungsten light, and for Panchromatic Process film. It is strictly for use in portraiture and for making commercial photos for advertising and catalog use, not for motion pictures.

The "X-2" filter is intended for commercial photography on SuperSensitive cut film in tungsten light. It can be used for cinematography, but it is not recommended. Its action is to soften the color-contrasts in a scene; it does not darken the sky, as do the yellow, orange and red "contrast filters," and it makes the green vegetation photograph unusually light.

If one wants to use a green filter for use with either regular or SuperSensitive Panchromatic motion picture films, the best filter to use is the Wratten "56-B" filter, which has a factor of 12 for regular panchromatic film, and 8 for SuperSensitive. I do not, however, advise the amateur to use any green filter in normal work. For more detailed information on these filters see Eastman's booklet, "The Wratten Light Filters."

—Ned Van Buren, A.S.C.

## EMBOSSED KODACHROME FILM.

"How are the embossed lenses in Kodachrome film, which show up on the screen as lines, made?" R. H. E., Jr., Orem, Utah, Pa.

The minute cylindrical lenses embossed on the celluloid film-base of Kodachrome film, and which, in combination with the tri-color filters and special one-inch lens used in taking and projection, are formed by running the film between steel rollers, upon one of which is engraved the desired lens-pattern. This is done after the film has been coated and slit, but before it is perforated. So far as is known, no solvents are used to soften the celluloid, the pressure alone being sufficient to emboss the lenses satisfactorily. The

roller-die used for embossing must be made with the utmost precision, and microscopic care used in both this engraving and in the embossing. Fuller details can be found in the patents covering the process, known as the Kellier-Dorian patents, issued to the "Société des Films en couleurs Kellier-Dorian," and assigned in this country to the Eastman Kodak Company. Copies of these patents may be obtained from the U. S. Patent Office, Washington, D. C.

—Frank B. Good, A.S.C.

## CONNECTING A PROJECTOR

**FOR SOUND-ON-DISC.** "I should like to know the simplest and most effective method of connecting projector to turntable for the showing of 16 mm. sound-on-disc pictures. We are making our own sound system and will use a model K Eastman projector."

—E. G., San Diego, Calif.

This depends in a large measure upon the type and design of the turntable you expect to use—its gear-ratio, bearings, balance, etc. Generally speaking, however, the best results are had by the use of a flexible-shaft coupling. This is best attached to the shaft of the lower sprocket, and may be done quite easily by removing the knob on this shaft, by which the mechanism is turned when threading, and which is held in place by a small pin passing through the shaft. It is important to be sure that your motor is sufficiently powerful to run the projector at the standard talking-picture speed of 24 frames per second and also handle the extra starting and other loads of the turntable, which must turn at 33 1/3 r.p.m. We are advised, however, that if the turntable is properly made, with ball bearings, etc., the motor of the model K will stand this load.

—Hans Tappenbeck, A.S.C.

**FILTERS FOR 16 MM. CAMERA MATTE-BOXES.** "What is the size of the filter used in 16 mm. filter-holder-matte-boxes?"

—W. V., San Diego, Calif.

Standard professional two inch square glass filters are used in practically all of these devices, as is also the case with most professional matte-boxes.

—Charles C. Clarke, A.S.C.





# Dieterich Composite Photography Process

(Continued from Page 9)

graphed by the blue-sensitive orthochromatic emulsion of the front ("red-ortho") film. The blue rays are thereafter absorbed by the filtering red backing of this film. The red rays reflected from the white backing pass through this front film, which is not sensitive to red, and through its filter backing, they then fall upon the background-film, which is as has been stated, a positive print made upon the extra-then Eastman Moxa Stock, passing through it exactly as the light of an ordinary contact-printer passes through a negative, and printing from this print a negative image upon the red-sensitive Panchromatic film at the rear. Obviously, the red rays from those portions of the backing behind the foreground set and actors are prevented from reaching the lens by these objects. Therefore the result is an image of the foreground set and action with a clear background on the "red-ortho" foreground negative, and a contact-printed negative of the background-print, with the foreground action in clear silhouette, on the rear negative. These two negatives are processed in the

usual manner, and may thereafter be double-printed in register after common practice. This method, however, did not allow for the uneven shrinkage of the two films in drying. Dr. Dieterich found, and would naturally tend to throw the two parts of the final composite print more or less out of register. Since, he reasoned, this shrinkage invariably starts during the drying operation, the logical thing to do was to combine the two films before this shrinkage could occur. Therefore, the two films are cemented together in absolute register while wet, and allowed to dry as a single film. Machines for performing this operation are in common use in several cinematography processes, in actual tests it has proven quite feasible, even, to merely place the films in contact in the proper register, with emulsions in contact and under pressure, for the adhesion of the two wet surfaces is sufficient to weld the two into one. However, Dr. Dieterich prefers, as a measure of safety, to cement the two films together regardless of the natural adhesion. This resultant composite master negative may

be used exactly as any ordinary negative would be for contact or optical printing, duplicating, and the like.

## Imposing Background

In event that the scene is such that the director, cinematographer or actors would benefit from being able to actually see the background-plate action in relation, as is possible with conventional projection-process cinematography, Dr. Dieterich states that it is entirely possible to project a second print of the background-plate upon the white backing, using of course, red light. This would serve the same purpose as the reflected red light from ordinary front-lighting the backing, and print the background action upon the rear film from the background-print in the camera. According to Dr. Dieterich, the focus, etc., of the projected image would be relatively unimportant, as this is automatically taken care of by the background-print used with the camera.

It is Dr. Dieterich's further plan to perfect his process by adding to it his already well known "Distar" lens system which automatically ensures perfect depth of focus from six feet to infinity.

Aside from the care that must be taken in lighting the foreground and background with colors of proper separation values and ensuring that neither

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set of lights permit either direct or reflected rays to fall upon the objects to be lit in the other color, no special precautions need be taken. The apparatus and materials are all commercially available or parts of existing commercial practice, the makeup for the actors is the standard orthochromatic makeup, the requirements for the background-negative film which the background-plates are made are held to be as simple as those for the background-plates for existing processes, if not simpler, and the balancing of the lighting is stated to be simpler and less exacting than in any previous process.

#### Superior Economy

Dr. Dietrich's claims for his new process (for which patents have been applied for) are superior economy, naturalness, and practicability, together with perfect focus, absolute elimination of "ghosts", fringing, excessive graininess, projector "hot spots" and unsteadiness, and with greater all-around simplicity than has yet been attained. Dr. Dietrich is now preparing a series of more exhaustive tests of the process, both in its present form and with the Dettar lens-system incorporated, which will be exhibited before a forthcoming meeting of the American Society of Cinematographers.

### Protecting the 16mm Investment

Continued from Page 26

equipped worker interiors, late and early-hour exteriors, cloudy weather, rain and night scenes, work in deep shadows, and last, but most fascinating, Kodachrome. Of course, such a lens can be used for general work quite as well as for these special purposes! Although it is true that in obtaining superior speed, the optical engineers are forced to compromise to some extent on such points as depth of focus, extreme sharpness, and the like, the fast lens is, stop for stop, in most respects equal to if not superior to the slower objective. In my own case, although I own a battery of half-a-dozen 16 mm lenses of different speeds and foci, including a one inch, f 3.5 and a one-inch f 1.8, I do over 80 percent of my work with the fast one-inch lens. I doubt if I have used the f 3.5 more than half-a-dozen times since I got the camera.

### Italy Demands Film Be Developed There

● THOSE who contemplate visiting Italy with their 16 mm cameras will find the rulings of the country demand that



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The Hoefner four-inch lens and sunshade combination is also a superior product.

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LOS ANGELES, CALIF

their film be developed and submitted to the Prefettura for censorship and permission to send abroad by mail. A small charge is asked for this service. It is

claimed no difficulty will be experienced if the film is taken out of the country as personal luggage if properly declared at the Customs.

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Hugo Meyer Wide Angle Lenses provide the opportunity for definitely superior work in indoor photography, poor light and under conditions where the photographer is practically on top of his subject. These lenses cover a 60° greater field than a 1 1/2" lens and are furnished in focusing mounts calibrated from 1/10 to 10 infinity.

It is not necessary to remove lenses from turret when revolving the latter.

Kino-Fluorant F./3.5, 15mm.	\$60.00
Triplex F./2.8, 15mm.	36.00
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## Explaining Film Latitude

Continued from Page 15

and still produce upon normal development negatives which render in density differences a faithful picture of the light intensities which existed in the original scene.

Laboratory processing has quite a little to do with the latitude of an emulsion, as is shown by its sensitometric characteristic. It is well understood in photographic work that a standard basic formula can be varied in its development rate and its other characteristics by an adjustment of the amounts and proportions of the various chemical constituents in it. Because of this fact it is possible for different laboratories processing motion picture film to use the same general type of formula and get the same kind of quality, although the formulas might not be exact duplicates of one another. There are a variety of methods by which films are developed and if the methods differ appreciably the formula must be so balanced to take care of each method. Particularly outstanding as different modes of development are the rack and tank system as compared with the high speed developing machine system. In the latter case the contribution of the development solution is much less due to the fact that agitation obtained in high speed development greatly enhances the rate of development.

Regardless of the mode of development, however, each individual case is thoroughly analyzed to allow for the best photographic results, which include such things as contrast and latitude.

## When You Title Your Own

Continued from Page 24

negative film is used to take pictures instead of the usual reversal type. It produces snappier, more contrasty results. If you prefer to employ reversal film use the ordinary pan-developer emulsion; it will produce better results than super-sensitive stock.

With the employment of positive stock direct positive titles can easily be made at home. An ordinary orange or red photographic safelight may be used with ordinary photographic trays, or if you haven't the latter, borrow clean enameled pans from the kitchen. Before you commence photographing your titles expose a short strip of film using three or four varying exposures, of which you keep a record of course. Take your camera to the dark room, remove and develop the strip, and from the results obtained determine the correct exposure. To facilitate subsequent cutting of the film for development, take the camera to the darkroom after each title has been photographed, and cut a notch in the edge of the film.

Titles made on reversal film should of course be sent to the laboratory of the

maker for processing. Those made on positive film as a negative from which a positive print is to be made will have to be sent to a professional laboratory unless the amateur is equipped with 16 mm. printing apparatus.

After your title has been finished it will be necessary to splice it into the roll of film. If reversal stock has been utilized it is added to the film in the usual fashion—so that the emulsion faces the lens. Direct positive titles are inserted in a similar fashion. Titles which have been made by first producing a negative and subsequently making a print are spliced into the roll of film with the emulsion facing the lamp house. This may produce slightly out of focus titles upon the screen if reversal film has been used for filming the action, for the emulsions of the reversal film and of the title are occupying opposite sides of the film.

## Books You Should Read

Continued from Page 25

of the American Society of Cinematographers were included. In these books you are given information that takes you many steps ahead in the making of motion pictures. It brings things into a clearer light for you, and gives you methods and materials used by the professional whose work is inspiring you every time you see it on the theatre screen.

These two books are by far the largest of the series recommended to you, but they contained information in advanced cinematography much of which you will find you can apply to your work.

While we know we learn more and retain our knowledge more readily if we can apply what we learn, the amateur will find that if he looks upon his finished film in the light of the knowledge he gathers from these books, he will not only have a finer understanding of what he is doing, of why certain things happen, but he will be taking his pictures with a more understanding eye and with the proper application of his knowledge secure results that will be an achievement of which he will be justly proud.

## Ernest Haller, A.S.C., to New York

● Upon completion of the locally-made portion of "International Hase" for Paramount, Ernest Haller, A.S.C., will go to New York to photograph the scenes which must be made there, utilizing radio and stage stars unable to come to the Pacific Coast. The production features Peggy Hopkins Joyce, W. C. Fields, Stuart Erwin, Bela Lugosi and Sam Martiza in addition to the radio names, and is being directed by Edward Sutherland.

## When A Professional Turns Amateur

Continued from Page 25

sensitive films. Filters were practically unknown in moving picture work; they had very little effect on the color-blind emulsions of those days—and very few professional cinematographers knew even as much about filters as does the average amateur of today.

Finally came a few covered stages, where we used very crude arc and mercury-vapor lights. These were hung permanently from the roof of the stage, and the sets were built in under the fixed lights. Small chance for artistic lighting effects there! Again, I nearly got fired, for on one scene that required a night-effect, I put a big spotlight outside of a window to throw a pool of light and shadow into the set, just as the moonlight would do in reality. Bitzer and the other cameramen and executives clustered round, and were highly shocked at such a thing. Finally, however, I was forgiven because I was just an amateur.

And that pretty well sums up the difference between the amateur and the professional. The amateur doesn't know that this "mustn't be done," or that that is "impossible"—so he goes ahead and tries it anyway. Nine times out of ten, he will be making a real mistake—but the tenth time he'll hit something new and effective. Yet he would never have gotten that effect if he had "known better," he wouldn't have tried it. So, while he may waste a lot of film in those nine unsuccessful tries, he will be more than repaid by the success of his tenth experiment.

### 16 MM. For Experiments

But don't take this to mean that the professional cinematographer is a hide-bound conservative. He isn't. Nine out of ten of us are experimenters, and the tenth is probably just starting in as a 16mm. professional amateur. We still want to experiment, and try out all sorts of ideas that occur to us, but in the present condition of the industry, we can't do that on actual production. We can't afford to gamble the company's huge investment in money, equipment and personnel (a matter which may amount to many thousands of dollars) a minute while actual production is on, against any personal experiments which may or may not be successful. Therefore, most of us are turning to 16mm. for our experiments. With the 16mm. cameras now available to the amateur cinematographer, we find that we can do far more than we could with the professional cameras of a few years ago. Moreover, our lenses and films are so closely identical with those we use professionally that we can rest assured of duplicating in the studio any effect we may get in 16 mm.

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## Riddle Me This

Continued from Page 13

the production cinematographer of undesirable responsibility and trouble, while resulting, I feel, in better and more efficient production.

**VIRGIL MILLER.** From my personal experience, I feel that the best policy for all concerned is the maintenance of a separate special-effects department—provided that that department and its personnel can and will cooperate with the production cinematographer as wholeheartedly as does the special-effects department of the Paramount Studio, under Farciot Edouart. Here, production is routine so that the process sequences come at the end of the schedule, after all of the scenes requiring a large crew or cast have been finished. During this time, the process staff have carefully prepared for the process sequences. Then the company, with a minimum of personnel expense, can go into the process work, while the production cinematographer and Mr. Edouart can concentrate undisturbedly on the problems of making the process scenes individually effective, and matching them perfectly with the rest of the picture.

When such cooperation is available, I can see no reason why any doubt should exist as to the best policy. It is certainly the most efficient: no cinematographer would willingly hold up an expensive company, whose overhead cost might amount to two or three thousand dollars an hour, while he made inserts which he could make as well later, with a skeleton crew. Neither should he feel justified in doing the same thing in attempting to make process scenes himself, holding up production while he figured everything out, made tests, etc., when a separate staff can do that without in any way jeopardizing his artistic and technical control of the resulting picture as a whole.

**THEODORE SPARKUHL.** It is entirely a matter of cooperation if the proper understanding exists between the production cinematographer and the special-effects man; it is far better to have a

special department for this work, if such cooperation does not or cannot obtain, the best results will follow giving the responsibility to the production man. However, from my own experience in Germany, I can say that it is impossible for a production cinematographer to do his best work on a picture if he is burdened with the worry of planning, scheduling and executing intricate special-process shots. On the other hand, if the special-process shots do not carry out the same idea that the regular scenes do, both will be more or less a failure.

We must bear in mind that motion picture production is essentially a cooperative undertaking in no phase can it be simply a one-man job. Taking photography alone, the cinematographer must cooperate with the director in order to realize the picture in the visual mood best keyed to the action and direction. Similarly, the special-process technician must, if his work is to be fully successful, cooperate completely with the production cinematographer in order to bring to the process shots the same mood and visual quality of the remainder of the picture. It is of course possible for either man to do an excellent job single-handed, but it is far too easy for either one, if left alone, to let his individual perspective bias his judgment of the needs of the composite scene. It is too easy, for instance, for the production man to become dazzled by the special technical requirements of the process shot, or for the process-man to overlook the artistic requirements of the scene. Therefore the best results must follow intelligent, whole-hearted cooperation between the two, each understanding the other's aims and problems, and both working together to make the resulting scene perfect in every detail. After all, production cannot be a one-man job; it must be complete mutual cooperation for the good of the picture.

**NAL MOHR, A.S.C.** At the Fox Studio, the production cinematographer is definitely in charge of all special-effects work on his productions. We have the advice and cooperation of excellent

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special-process technicians, but the net result is invariably up to the production's first cinematographer. In this way, we get better results, I feel, than could be possible under any system of divided or partially divided responsibility. In my own most recent release, for instance, "State Fair," at least 65 per cent of the footage released involved the use of background-projection. I had complete charge of the making of the final composite shot—I arranged my lighting after studying the background-plate and the foreground set and action, if the lighting I used interfered with the process, the process-men told me so, if the density of the background-plate made it impossible for me to carry out the effects or moods I needed, I told them so. In a word, we worked together in perfect harmony, and achieved a result that all of us can take pride in. I firmly believe, however, that the best results are to be had only this way, with the production cinematographer definitely responsible for the result of all process work.

### Using the Candid Camera

Continued from Page 15

Tim Car's western pictures, released through Monogram, have for some time made excellent use of the "Lecia" in making action pictures of chases, fights, stunts and such things for use in publicity, lobby displays and as material for the poster artists who make the action posters.

RKO used the "Lecia" on the miniature sets of their recent production "King Kong," and obtained publicity pictures which could not have been obtained in any other manner, not alone because of the small size of the "Lecia," but also because its lenses were perfectly matched in perspective and field of view with the objectives used in making the motion picture.

### Publicity Photos

A further and as yet only slightly developed field in which the motion picture industry could utilize the miniature camera is in the making of "candid camera" publicity photographs. The "Lecia," as is well known, is the original "candid camera," and the unique studies made of famous people in informal moments has whetted the appetites of public and editors alike. Modern news reporters, both American and Foreign, has already embraced the "Lecia" for this type of work. The studios would do well to do likewise, for they have already proven that there is a demand for such informal pictures of their players, even though the majority of them have been makeshifts, made with bulky and conspicuous reflex cameras. The Chadwick production of "Oliver Twist," already referred to, has led the way in this.



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Continued from Page 5

in Paris, the European laboratories are impossibly bad. This has an important bearing on the European picture, but an even more important one on our own foreign releases, since the release prints are usually made in the country where the film is to be exhibited—and, moreover, those of our foreign versions which are not dubbed with foreign-language dialogue are duped with superimposed titles. And if their regular processing is bad, their duping is, if possible, even worse. I do not believe that European audiences are seeing more than a very slight trace of the beautiful photographic quality our American cameramen are achieving. Some idea of this may, perhaps, be gained from the badly-duped prints of foreign films which we see here in this country. If anything, the foreign-made dupes of our own films are worse than these. It is a very serious question, for it is one of the factors which is killing off our foreign market.

Production costs in Europe are naturally lower than they are in America, almost everything is less expensive than here. Overhead is lower, materials are less costly, and salaries are as a rule decidedly lower—except in the case of cameramen. In Europe, a good cameraman usually receives a salary that would be considered high, even when judged by American standards.

Of course, in Europe's production scheme, things are much as they are here, they have their "specials," their program pictures, and their quickies, just as we

do here. But we in Hollywood are prone to get a false impression of European production, since we see only their specials—perhaps fifty out of five or six hundred films produced every year.

There are, none the less, some things where America can learn from Europe. In art direction, for example, Europe has much to show us, for while we have more money to spend on sets, and usually build our sets more substantially and out of more realistic materials, the Europeans often expend greater care and skill on the design and decoration of their sets. The European art-director is a much more important person than is his American confrere: he works through the picture with the director and cinematographer, his opinions receive greater consideration, and there is a great deal more cooperation with him than is usually the case here.

"Another technical development in which Europe is far in the lead is in cutting-machines. Compared to those in use in Europe, the best of ours are crude and inconvenient. There is, for instance, one such machine in general use there which will project the picture either on a small screen or through a large, magnifying viewing-system directly in front of the operator, and which automatically marks the film and soundtrack whenever a convenient button is pressed, and marks it instantly, making cutting a great deal easier and more accurate.

"On the whole, however, Americans—thanks largely to American Cinematographers and technicians—are far ahead of Europe and the rest of the world in the technique of production. As long as the American cinematographer retains this lead, we have little to fear."

**Soviets Develop New Color Process**

It is reported that the Soviet Film Trust has started its first all-color production, using a new process recently developed in Russia. No information as to the picture or the color-process has as yet been released.

**New Goldwyn Contract for Gregg Toland**

With a year to go on the previous contract, Samuel Goldwyn has just given a new contract to Cinematographer Gregg Toland. The new ticket is on a straight four-year basis. Toland has been loaned to MGM for the next four months, after which he will return to Goldwyn to photograph the next Eddie Cantor picture.

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